

Embracing the Infrastructure Evolution: Seizing present opportunities and adapting for the future

Infrastructure Outlook

2024



Contents

Introduction	
Six forces shaping the future of infrastructure investing	03
Infrastructure is holding its own: The rise of the infrastructure asset class	04
Luba Nikulina	
Weathering the Inflation Tsunami	10
Ashwin Mathur, Abbie Sui and Kalie Fung	
Investing in adaptation to protect value and provide essential services	15
Zachary May and Ramona Meyricke	
Growth Credit: How credit investing can promote climate technologies to scale	20
Sidd Bhat and Adelaide Morphet	
How the US Inflation Reduction Act is reshaping the investment landscape	26
Tom Osborne	
Driving out emissions: Decarbonisation of the transport sector	30
Aaron McGovern and Vivien Cheung	
Enhancing the customer experience at infrastructure assets	37
Kittredge Zuk and Timothy May	

Introduction

Six forces shaping the future of infrastructure investing

The resilience of infrastructure returns has been in the spotlight due to recent market volatility, and investors around the world are increasingly aware that infrastructure should be treated as a portfolio cornerstone.

We're at a convergence point where the asset class is starting to become mainstream, with inflows and deal competition ramping up, and a massive opportunity set emerging through the global energy transition. The time has come to consider infrastructure as equally vital to performance as the more traditional asset classes.

We are also seeing an expansion of the infrastructure investment universe. The definition of infrastructure is broadening beyond airports, ports and toll roads to include adjacent businesses such as water treatment or intermodal facilities.

This report focuses on six major themes that we believe are shaping the infrastructure market, including:

1 **Infrastructure's move to the mainstream:**

With its established track record, resilience to economic challenges over varied market cycles, and low correlation to other asset classes, infrastructure has emerged as a standalone asset class.

2 **Resilience of returns across economic cycles:**

Over the past two years, infrastructure returns have continued to demonstrate resilience, with unlisted infrastructure outperforming listed infrastructure and real estate.

3 **US policy opening doors for pension capital investment opportunities in climate projects:**

The Inflation Reduction Act presents opportunities for a range of green projects through tax credit transferability, benefits for startups and long-term investment opportunities for pension funds, with other countries and regions following suit.

4 **Growth credit financing helping to promote climate technologies:**

Scaling up proven climate-related technologies is essential for a low-carbon future. With equity financing facing economic headwinds, there is an opportunity for debt capital to provide a non-dilutive and attractive funding alternative.

5 **Decarbonising and climate-proofing assets to create returns for investors:**

Asset managers are backing sustainable fuels and electric charging to drive emissions out of transport infrastructure. Capital spending on decarbonising infrastructure should also be complemented with an equally crucial investment in future-proofing assets against the potential impacts of climate change.

6 **Investments in customer experience to drive efficiency, safety and throughput:**

With investment horizons spanning decades, infrastructure asset managers are leveraging data and new technologies to drive value for customers and investors now and over the long term.

DCT Gdańsk Port, Poland



Luba Nikulina
Chief Strategy Officer

Infrastructure is holding its own:

The rise of the infrastructure asset class

More than two decades since Australian superannuation funds first ventured into infrastructure, it is evolving globally as a standalone asset class.



For decades, governments have been eager to attract private capital — and especially pension capital — to help fund the infrastructure spend their communities need. Well-established as a standalone asset class in Australia and Canada, infrastructure has become a mainstay of pension portfolios in both countries due to its ability to act as a natural inflation hedge and its lack of correlation with returns generated by listed equity and debt, which for decades were the foundational asset classes for any portfolio. But as interest in infrastructure increases across the globe, the time has come to consider it as equally vital to the performance of institutional investors' portfolios as those more traditional asset classes.

The Australian superannuation market is widely credited as having been the first to move into infrastructure investment in the 1990s. Spurred by the privatisation of the nation's capital city airports, this led to many — specifically the not-for-profit

sector known as Industry Super Funds — to establish a private markets or alternatives allocation that encompassed the emerging asset class, as well as property and other unlisted opportunities.

Establishing Infrastructure

While Australia pioneered investing in infrastructure by creating a domestic market, Canada brought the concept to the wider world when allocating to the asset class. Following significant pension reform that saw eight major pension plans¹ build up in-house investment management expertise, known as the Maple model reforms, these funds began directly investing in infrastructure outside of Canada in the early 2000s, followed by a move by Australia's superannuation sector to solidify its exposure to infrastructure by investing overseas.

¹ The Maple Eight are now known as AIMCo, the British Columbia Investment Management Corporation, Caisse de dépôt et placement du Québec, the Canada Pension Plan Investment Board, the Healthcare of Ontario Pension Plan, OMERS, the Ontario Teachers' Pension Plan, and PSP Investments.

This first-mover advantage meant investors in both countries were able to gradually build up a dedicated infrastructure exposure, outside of a private markets or alternatives allocation. The growth in the sector has led to an increased maturity in the way assets are assessed, and the risks taken on by investors. With a track record spanning more than two decades, we can now conclusively say that the risks taken on by and returns enjoyed from infrastructure are significantly differentiated from any of the other asset classes that may sit within the private markets or alternatives sectors, meaning that infrastructure has truly come into its own as a standalone asset class.

Unlike equities and bonds, unlisted infrastructure’s underlying return streams are highly linked to regulatory or contractual frameworks, associated with the nature of these assets as providers of essential community services. As witnessed over the last couple of years of pandemic, war and inflation, this means that the asset class can often continue to perform in such difficult economic climates, even where the macroeconomic environment will impact the returns of other mainstay assets.

Recent years of inflation and increasing interest rates have demonstrated the strategic importance of an exposure to infrastructure due to its resilience through economic cycles and effectiveness as an inflation hedge. We believe the infrastructure asset class has a role to play as a foundational portfolio asset class aimed at securing diversified, less volatile, low correlation long-term returns.

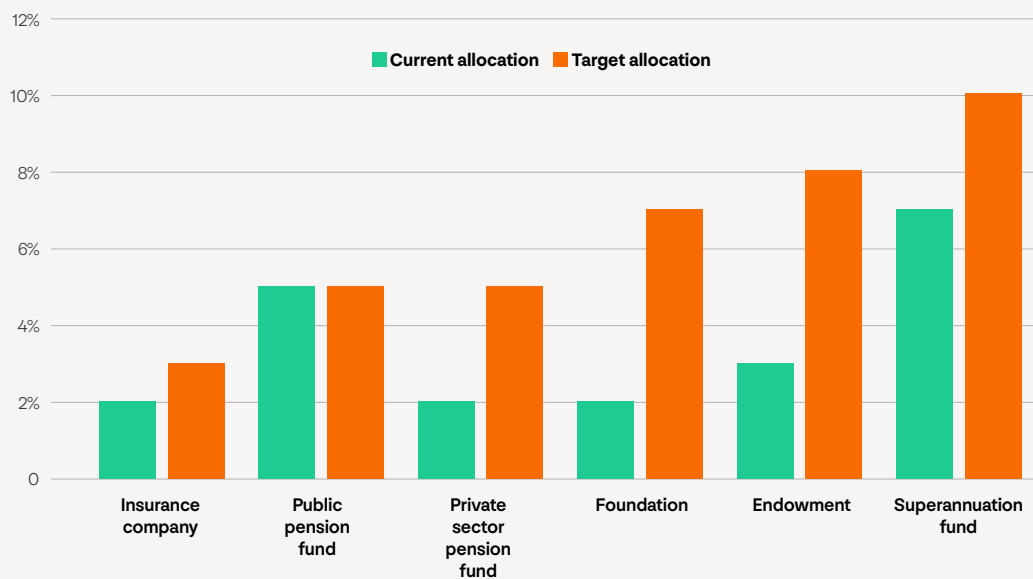
Looking beyond Australia

Despite the fact that infrastructure is established as a standalone asset class with established track records in the Australian and Canadian markets, Europe, Asia and the US are still, overall, placing infrastructure within an ‘alternatives’ allocation.

However, a number of countries within Europe have been making significant strides in the last decade, and governments have attempted to drive greater allocation to the asset class. In the UK, since 2016, English and Welsh local government pension

FIGURE 1

INVESTORS’ ACTUAL VERSUS TARGET ALLOCATION TO INFRASTRUCTURE



Source: Preqin Global Report: Infrastructure 2024, data from 2023.

schemes have been required to set up collectively owned asset managers, in part to cut costs, but also with an eye on the schemes, which in 2022 had assets of £369bn, allocating a greater percentage of their funds to infrastructure. The country's rapidly growing defined contribution market is also exploring the asset class, with the National Employment Savings Trust (NEST), the country's largest defined contribution pension fund, among the first to make a meaningful allocation. Other pension investors have been building up direct and indirect stakes in the asset class in recent years, with Europe's largest pension fund ABP acquiring a stake in Australian electricity distributor Ausgrid in 2021. Even countries where infrastructure may have previously been viewed as part of the alternatives allocation are beginning to view it as a standalone asset class, with Switzerland recently amending investment rules for its second pillar pension funds to list it as its own asset class, and Germany is expected to implement a similar reform soon.

In parts of Asia, such as South Korea and Japan, asset owners have gradually built their exposure over the last decade. Korea's National Pension Service (NPS) disclosed a KRW41.1trn (\$31.2bn²) allocation to infrastructure as of September 2023, equating to a quarter of its alternatives portfolio and 4.2% of its overall assets. Both the NPS' allocation to infrastructure and alternatives holdings have doubled in five years since 2018. For its part, the Government Pension Investment Fund, Japan's largest asset owner, first began investing in infrastructure a decade ago through a co-investment agreement with one of the Maple Eight, OMERS, gradually building infrastructure to be the largest allocation within alternatives, also comprising property and private equity. The fund announced last year that it would continue to build exposure and venture beyond its co-investment approach to directly allocate to select partners.

In the US, the scale of the market goes some way to explaining the scale of the challenge, and why it may remain a smaller allocation, relative to overall portfolios. In over a decade since 2011, the pension sector has committed significant sums to infrastructure, estimated at \$134bn,³ but this pales in comparison to the \$40trn size of the market. The country's largest public pension fund, CalPERS, for example, has a significant allocation of \$14.1bn to



infrastructure, which only accounts for 3.2% of its \$443bn portfolio.⁴ Additionally, many of the more mature funds in these defined benefit (DB) markets struggle with the weakened funding and a future of negative cashflows, limiting their appetite for long-term, illiquid holdings, despite the generally stable cashflows associated especially with core infrastructure. Nevertheless, we believe the sector will work to increase its average infrastructure allocation of 3-4%, even if it has a long way to go before it can reach the level of allocation of Canadian funds, which, on average, have a 10.5% allocation.

US pension investors and those wishing to grow their exposure to the US will also see an increase in infrastructure opportunities in the coming years as the impact of the Inflation Reduction Act is fully felt. Half of the Act's \$739bn in funding is allocated to clean energy and climate investments, resulting in a significant boost to renewable energy and energy security infrastructure, such as solar power and battery storage, significantly boosting growth in a sector that has already become, and is likely to continue to be, the single-biggest growth opportunity in the coming years.

It is clear from the examples above that investor appetite for infrastructure is not fully sated. According to Prequin's global report, in many cases, institutions continue to fall short of their desired target allocation by several percentage points (Figure 1).

² Currencies in this paper are in USD, unless otherwise stated.

³ Major pension funds are steering big dollars to infrastructure (PIOnline.com)

⁴ CalPERS seeks sustainable investments to grow infrastructure portfolio (realassets.ipe.com)

Broadening the definition of infrastructure

Today, maturity in the decision-making of long-term infrastructure investors can be contrasted with the opportunistic approach of investors to the asset class in the 1990s. Following decades of ownership, there is now a better understanding of the infrastructure sector, one that has seen a re-interpretation of what defines 'core' infrastructure and the returns expectation associated with it. Where airports were the foundation of many Australian infrastructure portfolios, they have since been joined by ports, energy transmission infrastructure and train stations.

Adjacent to these indispensable core infrastructure assets that often possess a strong market position, conservative leverage, predictable regulatory environment and high barriers to entry, is an

additional universe of opportunities. The adjacencies could be contractors or suppliers to core infrastructure assets, such as water treatment facilities servicing the sole water utility in a region, or an intermodal facility servicing a seaport.

This broadening definition of infrastructure allows more flexibility as investors navigate market cycles and consider the appropriate time to include this foundational asset class within their portfolios in ways similar to Australian investors, allocating to these adjacent sectors as they open up to pension capital. Based on the established track record of the asset class, its resilience to macroeconomic challenges and its low correlation to other foundational asset classes, the attractiveness of infrastructure is becoming increasingly apparent.



Anglian Water, UK

The next decade of infrastructure

The global energy transition will arguably be the most significant structural change undertaken since the early industrial revolution. Over the next three decades, over \$100trn will need to be deployed to completely restructure our economy — much of which will take the shape of infrastructure equity funding for renewable energy and climate change adaptation methods.

Crucially, this need for additional capital coincides with significant — and potentially permanent — changes to other alternative

asset classes. Since the COVID-19 pandemic heralded the advent of remote working, owners of office buildings have struggled with the lack of demand for their properties, reflected in the weaker performance of commercial real estate. A Deloitte survey of commercial property chief financial officers conducted in late 2023 found them predicting a second year of declining revenues, with two-thirds of respondents in Europe and 60% of those based in North America predicting a continued decline.⁵

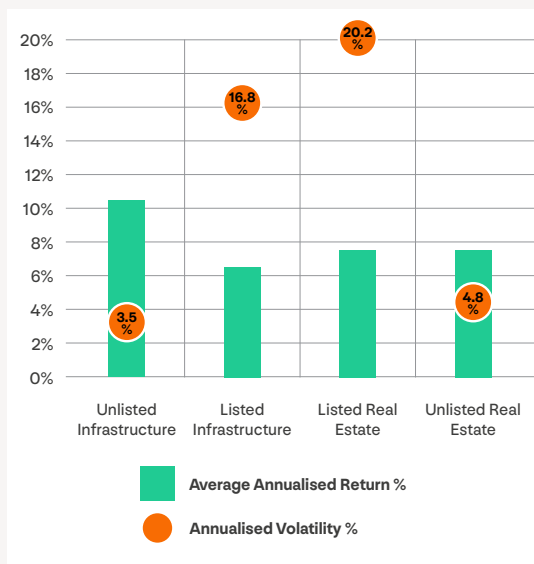
Historically, property has been considered a foundational asset for many institutional investors. But in light of the seismic changes occurring in commercial property, and both listed and unlisted property's weaker performance, with higher volatility than unlisted infrastructure (see Figure 2), this allows for a discussion as to whether a shift away from commercial property will see infrastructure take its place in portfolios.

The re-evaluation of infrastructure, coupled with many European countries transitioning from a legacy DB market with a limited investment horizon to one with large, dominant and cashflow positive defined contribution (DC) funds, will potentially allow investors to replicate the success of Australia's superannuation sector. The first-mover advantage associated with the strong returns of the 1990s and early 2000s could once again be available to these institutions emerging in countries, including the UK and Ireland, where semi-compulsory savings pools are about to be, or have already been, established.

These DC funds will be able to invest their beneficiaries' savings to support, and ultimately, accelerate the coming energy and net-zero transition that will require existing infrastructure to be upgraded and the construction of the next generation of infrastructure assets.

FIGURE 2

AVERAGE RETURN AGAINST ANNUALISED VOLATILITY



Sources: OECD, MSCI, Bloomberg, Burgiss Universe Analytics.

Asset class performance reflects the change in the returns of the following indices: Unlisted Infrastructure – MSCI Global Quarterly Private Infrastructure Asset Index (Unfrozen); Listed Infrastructure – S&P Global Infrastructure Index; Unlisted Real Estate: NCREIF Property Index; Listed Real Estate – FTSE EPRA/NAREIT Developed Index. Total returns represent the annual four-quarterly rolling data from 31 March 2009 to 31 March 2023.



Brisbane Airport, Australia



Ashwin Mathur
Director,
Portfolio Management



Abbie Sui
Vice President,
Portfolio Management



Kalie Fung
Vice President,
Portfolio Management

Weathering the Inflation Tsunami

As central banks approach the end of their tightening cycle and the global economy rides out its third significant crisis in 15 years in the form of high inflation and rates, we examine how infrastructure remains resilient despite, and in some cases due to, these factors.

The Inflation Tsunami

Not too long ago, consensus forecasts had anticipated a prolonged period of low inflation, with central banks grappling to meet the modest inflation targets prior to 2020. We have however seen a complete shift in this perspective in recent years, driven by significant disruptions in the global economy resulting initially from the COVID-19 pandemic and subsequently a rise in geopolitical tensions. Since mid-2021, inflation has been on the rise worldwide due to pandemic-related economic dislocation and supply chain disruptions, with many countries experiencing the highest inflation in decades - what we now refer to as the “Inflation Tsunami”.

The rapid cycle of monetary tightening imposed by central banks in response to this tsunami has started to push inflation back down to central bank target ranges, and slow global economic growth, although this has taken longer than originally expected.

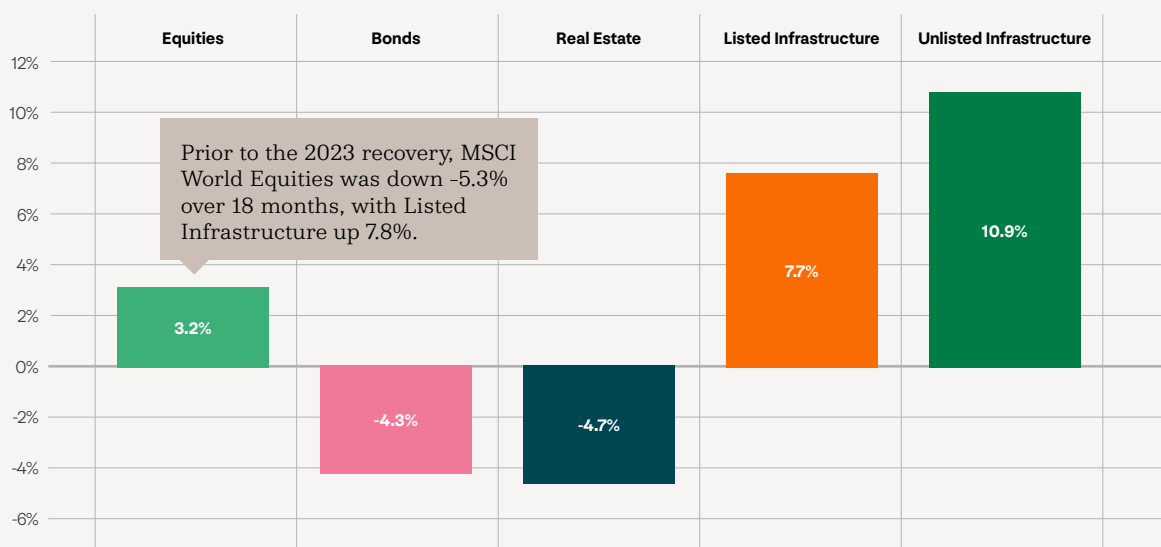
Surfing the wave

Infrastructure returns have demonstrated resilience over the past two years as both inflation and rates rose rapidly since the global economy emerged from the pandemic. Unlisted infrastructure in particular has exhibited heightened resilience compared to its listed counterparts and real estate, showcasing lower volatility in returns and reduced susceptibility to market sentiment, and therefore in our view playing a valuable role in investors’ portfolio allocation.

We believe this resilience is underpinned by investing in essential real assets that provide a natural inflation hedge and greater protection from interest rate fluctuations than the broader market. Generally, the majority of core infrastructure assets have revenue streams directly linked to inflation or possess some form of indirect inflation protection. This linkage can take various forms, such as direct CPI escalators, CPI floors, fixed escalators, or a combination of these mechanisms.

FIGURE 1

GLOBAL MARKETS – ANNUALISED RETURN FOR THE TWO YEARS ENDED JUNE 2023



Sources: Bloomberg, MSCI

Equities: MSCI World 100% Hedged to USD Net TR USD; Bonds: Bloomberg Global-Aggregate Total Return Index Value Hedged USD; Real Estate: S&P Developed REITs USD-Hedged Net Total Return Index; Listed Infrastructure: S&P Global Infrastructure USD Hedged Net Total Return Index; Unlisted Infrastructure: MSCI Global Quarterly Private Infrastructure Asset index (Unfrozen).

Take a typical ‘dual-till’ airport for example: most aeronautical charges exhibit a direct linkage with inflation, whilst non-aeronautical revenues (including car parking, retail and property revenues) are all linked to inflation in either a direct or indirect manner. Similarly, most regulated utilities stand to benefit from a regulatory framework that ensures inflation protection by guaranteeing real returns or providing inflation indexation.

In the context of the accompanying rise in interest rates, two concerns commonly arise among investors: interest rate risk to cashflows and interest rate risk inherent in valuations through the risk-free rate component of the discount rate. The former is managed via conservative use of leverage, locking in long-term fixed rate debt and establishing laddered maturities across the portfolio; the latter is mitigated by the long-term normalised approach generally taken by external valuers to determine the risk-free rate.

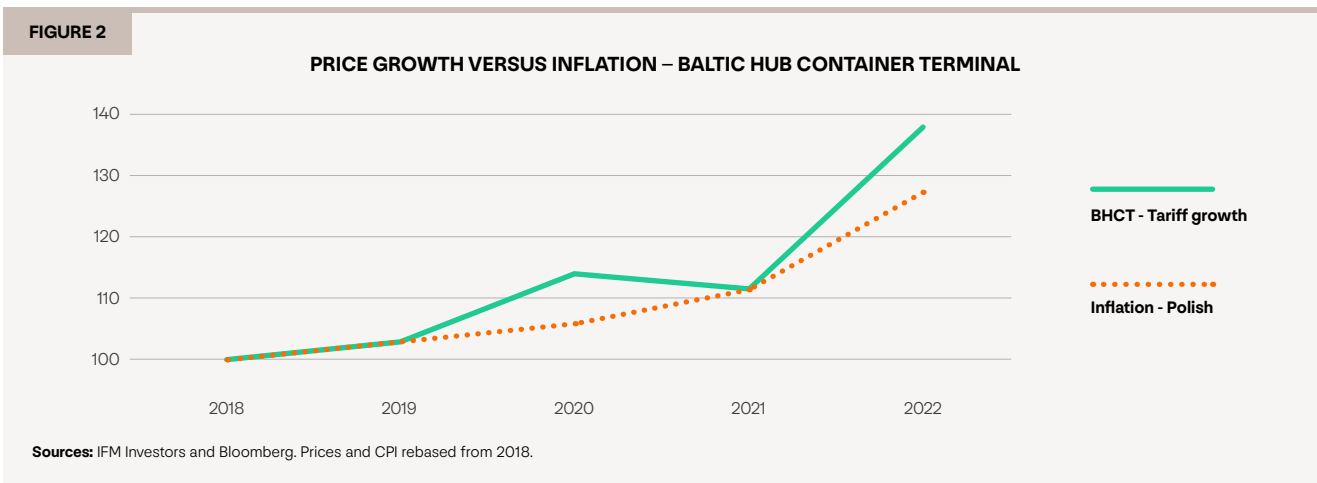


Baltic Hub Container Terminal, Poland

Price growth surpassing inflation

As outlined above, the resilience of the infrastructure asset class can be attributed to its inherent characteristics as a natural inflation hedge, with most core infrastructure assets typically having pricing mechanisms directly or indirectly tied to inflation. It is evident that many infrastructure assets have a track record of price escalation outpacing inflationary trend, and we provide an example of this below.

Baltic Hub Container Terminal (“BHCT”)¹ has the ability to negotiate its tariffs directly with shipping lines, and importantly in recent years has shown its ability to pass through Polish CPI through indexed handling tariffs. BHCT’s tariff growth has, on average, exceeded Polish CPI for four years from 2018 to 2022.



¹ Baltic Hub Container Terminal (“BHCT”), formerly known as DCT Gdańsk, is the largest and fastest growing Polish container terminal. Located in the heart of the Baltic in the Port of Gdansk, it is the only deep-water terminal in the Baltic Sea region having direct ocean vessel calls from the Far East.

What if the wave breaks? Infrastructure's resilience

Market dynamics have become more complex and no longer follow the conventional wisdom of prior decades. There is considerable uncertainty about the longevity of the expansionary period we find ourselves in, and therefore in how inflation and rates will continue to impact market sentiment and returns. We find that unlisted infrastructure not only provides relatively robust returns in an inflationary environment but also demonstrates resilience through a variety of macro conditions. Taking a look at the long track record of various asset classes across distinct macro seasons, segmented

into quadrants where real GDP growth and CPI were above or below average levels (set as 2%), unlisted infrastructure (represented by the MSCI Global Private Infrastructure Fund Index) consistently exhibited nearly double-digit returns across all scenarios. In contrast, listed equity (represented by the MSCI World Index) demonstrated suboptimal performance in the stagflation quadrant characterised by low GDP and high CPI, yielding a flat annual return of 0.4% p.a., while the Bloomberg Global Aggregate Total Return Index delivered returns ranging from -1.4% to 4.5%.

FIGURE 3

UNLISTED INFRASTRUCTURE REMAINING ROBUST THROUGH VARIED ENVIRONMENTS

■ Unlisted Infrastructure (MSCI UGI)
 ■ Listed Infrastructure (S&P GI)
 ■ Listed Equities (MSCI World)
 ■ Listed Bonds (Bloomberg Global)



Source: Bloomberg, MSCI, The Organisation for Economic Co-operation and Development, S&P Capital IQ.

Unlisted Infrastructure proxied using MSCI Global Quarterly Private Infrastructure Asset index (Unfrozen) ("MSCI UGI"), Listed Infrastructure proxied using S&P Global Infrastructure USD Hedged Net Total Return Index ("S&P GI"), Equities proxied using MSCI World 100% Hedged to USD Net TR USD ("MSCI World"), Bonds proxied using Bloomberg Global-Aggregate Total Return Index Value Hedged USD ("Bloomberg Global").

High/Low CPI and GDP are based on US Consumer Price Index (CPI) and US real Gross Domestic Product (GDP), respectively, and are defined as quarterly changes on the annual four-quarterly rolling basis exceeding or falling below a 2% threshold. Total returns represent the annual four-quarterly rolling data from 31 March 2010 to 30 September 2023.

It is worth noting two key examples of resilient performance of infrastructure through the most recent market dislocation, the COVID-19 pandemic.

First, whilst the transport of people faced substantial disruptions, the movement of goods (i.e. the freight component) across roads and ports was particularly robust and recovered rapidly. Despite lockdowns and travel restrictions, heavy vehicle traffic across toll roads dipped only marginally in 2020 and has since recovered to pre-covid levels.

Secondly, a number of infrastructure assets possess a countercyclical nature. For instance, the demand

for essential services such as utilities tends to remain relatively stable regardless of economic conditions, and in a so-called contango global fuel market scenario (where the future price of crude oil surpasses the spot price due to oversupply), the demand for storage of crude oil and refined products can increase. This countercyclical nature serves to enhance the resilience of a portfolio during economic downturns. This countercyclical protection is not offered by other asset classes, with the paradigm changing for some in the wake of the pandemic, such as the shift to remote work undermining the previously stronger performance of commercial real estate.



Sticking the landing

Whilst it seems as though the inflation tsunami may have crested, how long it takes to taper remains highly uncertain, bringing with it a series of asset allocation challenges for investors.

The infrastructure asset class's inherent characteristics include the essential nature of the services provided, the strong linkages to inflation and the resilience in the face of macroeconomic volatility and market dislocation.

These characteristics can help meet the asset allocation challenges that investors face, and we believe that investments in well-structured and well-diversified unlisted infrastructure portfolios will continue to play an important role for long-term investors looking to build resilient portfolios that will weather the conditions ahead of us.



Naturgy Solar Plant, Brazil



Zachary May
*Executive Director,
Policy & Strategy*



Ramona Meyricke
*Director, Policy &
Quantitative Research*

Investing in adaptation to protect value and provide essential services

Policymakers and investors are pursuing the global economy's transition to net zero. While efforts to decarbonise accelerate, investors and operators must also be mindful of increasing the resilience of existing infrastructure to a changing climate.

Transitioning the global economy to net zero will arguably be the most significant structural change undertaken since the industrial revolution. Much of the focus of action is, rightly, on reducing emissions and reaching net zero. But as the impacts of climate change accelerate, investing in adaptation and climate resilient infrastructure must be prioritised alongside decarbonisation.

Losses from natural catastrophes, such as floods and storms, set a global record in the first half of 2023, costing \$120bn, 46% above the 10-year average of the last decade¹. These extreme weather events – set to become more frequent and more severe as climate change continues² – have a wide range of financial implications, including direct damage to assets and indirect impacts such as supply chain disruption, workforce security and safety.

This means infrastructure investors and operators not only need to place an aggressive focus on emissions reductions and growing value as the world decarbonises, it also means building the resilience and adaptability of infrastructure to continue to provide essential services in a changing climate. As well as enabling the critical community services infrastructure provides to continue, adaptation reduces risk for infrastructure investors and protects the value of these assets.

Investing for a resilient future

There is a clear economic rationale for substantial investment in adaptation. According to the Global Commission on Adaptation, convened by 23 countries in 2018, extending the lifetime of assets by investing in early warning systems and securing existing infrastructure had benefit-cost ratios ranging from 2:1 to 10:1.³ Investment in adaptation can be viewed as returning a triple dividend of avoided losses, increased productivity and resulting social and environmental benefits. In its global call for leadership on climate resilience, the Commission estimated that if \$1.8trn were committed to adaptation in the decade to 2030, it would yield net benefits in excess of \$7trn – a roughly \$4 benefit per dollar spent on adaptation.⁴

All currencies in USD unless otherwise stated.

¹ Swiss Re (2023)

² IPCC Summary for Policymakers

³ ADAPT NOW: A GLOBAL CALL FOR LEADERSHIP ON CLIMATE RESILIENCE

⁴ Ibid.

⁵ United Nations Environment Programme (2023). *Adaptation Gap Report 2023: Underfinanced, Underprepared. Inadequate investment and planning on climate adaptation leaves world exposed.*

⁶ Tracking Investments in Climate Resilient Infrastructure, December 2022.

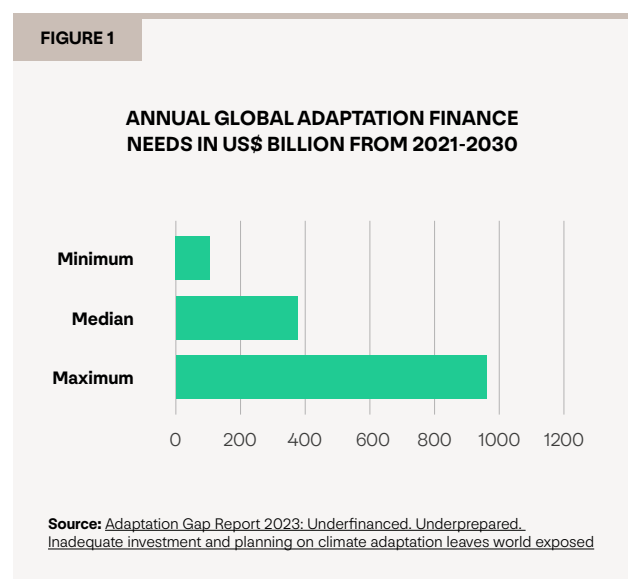
⁷ It's Time to Invest in Climate Adaptation (hbr.org)

⁸ Sustainability accounting and valuation standards (such as the International Financial Reporting Standards (IFRS) Sustainability Disclosure Standards) are evolving to focus on financially material Environmental Social and Governance (ESG) risks and opportunities. This creates an increasing need for investors and management of businesses to assess the value drivers of businesses with not just a financial lens but also with an ESG lens.

Yet despite the strength of the business case and benefits for investors, the financing gap for adaptation remains staggering (Figure 1).⁵ Climate mitigation investments such as in renewable energy infrastructure have received more finance than adaptation investments.⁶ This is partly because many adaptation projects are not directly linked to a cashflow generating activity. Instead, they deliver value by reducing the losses from extreme weather events, which are uncertain and complex to quantify.

Despite this uncertainty – there is a strong business case for private adaptation investment in solutions that are low cost, proven to be effective, and have immediate impact, such as early warning systems for extreme weather events, coastal barriers, or improved cooling and insulation systems.⁷ The climate adaptation opportunity is already enormous, and the need for adaptation solutions is likely to grow as climate impacts become more prevalent.

For infrastructure investors, as outlined in the case studies throughout this article, adaptation can positively affect the cashflows of portfolio companies, by helping to ensure revenue-generating services are more resilient to increasing physical risk, thereby protecting the value of these assets.⁸



The need for locally tailored approaches and community involvement

As a responsible infrastructure manager, IFM Investors reviews its infrastructure portfolio to seek to ensure the services provided by assets can remain reliable during extreme heat, storms, floods, and other extreme weather events. Such risks are becoming apparent in countries such as Australia, where IFM has significant holdings.

The Intergovernmental Panel on Climate Change (IPCC) advises that proactive adaptation can substantially reduce the overall costs of climate change,^{9,10} and that successful adaptation to climate change requires strategies to be context-specific and responsive to local needs, a view fully shared by IFM in the context of infrastructure.¹¹

Accordingly, investment in adaptation will not always see identical steps taken across all assets in a portfolio, as adaptation needs are sensitive to local circumstances. In concept, a desire to address flood risk could see investment in early warning systems, dams and flood levies, all the way through to relocation of certain operations if a location is no longer viable.

Approaches that are place-based and tailored to asset-specific circumstances are illustrated through three case studies of how assets in IFM's infrastructure portfolio are working to enhance their climate change resilience. We have selected examples from Australia, mindful of Australia's acute adaptation needs insofar as it has already experienced average temperature increases of around 1.47°C since 1910.¹²

CASE STUDY

Electricity distribution in Australia

Ausgrid (in which IFM is a major investor) is the largest electricity distributor on the east coast of Australia and services its most populous state, New South Wales. Ausgrid is exposed to a range of climate risks, including storms, heatwaves, and bushfires, which can put the community at risk of prolonged power outages. To address and mitigate these risks, the company works directly with communities to develop local resilience plans, and understand the kinds of support it is best placed to offer – such as more resilient overhead power structures that are further insulated, or establishing community support hubs.

Additionally, the company has established an asset inspection and maintenance regime to identify bushfire risks, and employs aerial scanning using light detection and ranging (LiDAR) to ensure vegetation is cleared around assets ahead of bushfire and storm seasons.



⁹ Where costs are defined as the economic implication of either repairing damage or, in the case of user and indirect costs, of failing to repair the damage.

¹⁰ See, e.g., IPCC, 2022: Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)], Cambridge University Press. Cambridge University Press, Cambridge, UK and New York, NY, USA, 3056 doi:10.1017/9781009325844. (p. 955 citing Wright et al. (2012) for the proposition that proactive interventions to strengthen bridges in the USA would reduce adaptation costs by 30%).

¹¹ AR6 synthesis report 3.4.2, stating that "Integrated, inclusive planning and investment in everyday decisionmaking about urban infrastructure can significantly increase the adaptive capacity of urban and rural settlements."

¹² [NSW Environment Protection Authority, Increasing frequency and intensity of extreme weather events \(nsw.gov.au\)](https://www.environment.nsw.gov.au/news-events/news/2022-09-27-increasing-frequency-and-intensity-of-extreme-weather-events).

Long-term investors and financing infrastructure adaptation

The Brookings Institute in the US conducted extensive research on the barriers to financing a more resilient built environment in the US and found that the lack of climate investment was partly due to a planning process that often overlooks climate risks, costs, and benefits and a project financing approach that focuses on individual projects in isolation of the overall system of interconnected developments.¹³

To address these challenges, adaptation financing frameworks for resilient infrastructure need to recognise interdependencies across the built environment and climate risks, costs and benefits.

As the Port Kembla example on the right shows, the interdependencies mean any impact can easily cascade across networked systems, meaning no single actor can be expected to address all risks. Governments should be involved in coordinating – through an appropriate regulatory framework – and helping direct financing of adaptation.

These interdependencies also affect the economics of adaptation investment. As noted by the IPCC, some adaptation actions create public goods that benefit many, and in such cases private actors generally cannot capture all of the gains, resulting in them not undertaking a socially desirable level of adaptation without public support.¹⁴

 **Adaptation financing frameworks for resilient infrastructure need to recognise interdependencies across the built environment and climate risks, costs and benefits.**

CASE STUDY

Seaport operations

The physical impacts of climate change not only affect assets, but also affect their workforces, supply networks, and other stakeholders. Well-considered adaptation plans therefore need to consider not just the asset itself, but the broader network of relationships necessary for its effective operation. This is the situation that confronted **Port Kembla**, part of **NSW Ports** in Australia (in which IFM is a major investor), in 2022, following one of the country's worst flood disasters. Following the flood, the port itself was unaffected, but the infrastructure allowing its customers to deliver and retrieve freight was damaged. The continuity plan was initially successful: customers were able to reroute grain and steel delivery through Sydney's busy metropolitan rail network, where capacity allowed. But following a landslide, further disruptions saw the port cut off from the train network.

NSW Ports maintains a proactive crisis management strategy which includes Disaster Recovery Plans and Business Continuity Management Plans. In addition, NSW Ports continues to advocate for rail upgrades in priority regions.



¹³ SA new climate finance framework for investing in urban resilience | Brookings

¹⁴ See IPCC, 2018: Economics of Adaptation at 171. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.

Where collaboration with the private sector is appropriate, government can assist through blended finance and de-risking projects. Governments and public sector entities could offer concessional loans that may include lower-than-market interest rates, longer loan maturity, or longer and more flexible grace periods before the payment of principal and interest is due as a way of distributing the cost of protecting essential infrastructure to the broader beneficiaries.

In conjunction, governments can also help de-risk investments in adaptation through policies that proactively address physical climate risks, such as in infrastructure planning and standards that promote resilience, and a strong information architecture for climate data and physical risk disclosures.

Private investment in infrastructure by long-term, patient capital can also help promote adaptation. Long-term capital that prioritises the future of an investment will be better able to consider the physical climate risk over decades and factor this into the business case for adaptation, mindful of the

importance of customers and the wider community in the success of the business. We believe Public-Private Partnerships, such as our co-ownership of Ausgrid alongside the New South Wales government, are most successful when the partners have strong incentives to consider the long term. Infrastructure investment by pension funds and similar long-term investors can help to supply the capital required to fund the adaptation required globally.

The efforts to accelerate innovation in climate adaptation – whether through financing, technology or knowledge transfer – need to deliver on all points. Any platforms for adaptation need to bring together stakeholders and tools to mobilise capital and deliver resilient infrastructure at scale. In time, scalable models designed with trusted partners must be able to deliver more resilient infrastructure globally.

The climate is changing rapidly. Alongside decarbonisation, infrastructure investors and managers can protect and grow the cashflows and value of portfolio companies by helping to ensure revenue-generating services are resilient to climate risk, thereby protecting the value of these assets.

CASE STUDY



Airport operations

Queensland is the most disaster-prone state in Australia, and the most impacted financially. The state experienced significant flooding in 2022, the costliest in Australia's history, and flooding risk is increasing due in large part to climate change.¹⁵ Brisbane Airport (in which IFM is a major investor) is the main airport for the state of Queensland and, in constructing its newest runway – a AU\$1.1bn, privately funded undertaking – Brisbane Airport Corporation took account of the flood risk it faces. Bordering directly onto the ocean in an area often subject to cyclones, it was accepted that flood risk would only increase in coming years as extreme weather events became more common. In anticipation of the risks posed by extreme rainfall, floods and sea level rises, the airport flood model incorporated a range of climate scenarios, and determined that 98% of assets remain above the flood level for a 1 in 100 year flood event. It has further developed asset management plans to inform the upgrade and replacement of key airport infrastructure that takes account of the same climate scenarios, and incorporates the risks into design standards. Because of the close integration of climate risk, in some sense the capital expenditure program is also an adaptation investment program.

¹⁵ 20683 ICA Final WebOptimised SpreadsView.pdf (insurancouncil.com.au)



Melbourne Airport, Australia



Sidd Bhat
Executive Director,
Debt Investments



Adelaide Morphett
Associate Director,
Sustainability Specialist
Debt Investments

Growth Credit:

How credit investing can promote climate technologies to scale

Over the past decade, the adoption of climate technologies has consistently outpaced forecasts. For example, cumulative installed capacity for solar panels in 2020 exceeded global forecasts in 2006 by 25 times.¹ This acceleration demonstrates a firmly positive trajectory, but is the adoption rate fast enough?

In order to meet the 1.5°C target outlined in the international treaty on climate change known as the Paris Agreement, renewables will need to sustain their currently high growth rates, with a five-fold increase in installed capacity in North America and a three-fold increase in Europe by 2030.¹

This challenge is compounded by what Mark Carney has dubbed the “Tragedy of the Horizon” – a reference to the financial sector’s ongoing struggle to reconcile financial short-termism with critical longer-term climate goals. While some climate technologies are well-understood (e.g. solar and wind), many occupy a more nascent end of the spectrum and will be responsible for nearly half of the cumulative emission reduction that is needed between now and 2050.²

This spectrum of opportunities is bolstered by climate-focused public sector initiatives. Government infrastructure investment programs such as the US Inflation Reduction Act, the EU’s RePowerEU and the UK’s Build Back Better amount to hundreds of billions of dollars in support for decarbonisation

efforts, including climate adaptation. This is coupled with record-breaking allocation of capital towards climate-focused funds. According to Prequin, over \$32 billion has been raised by climate funds in 2023, 55% higher than the year prior and 11 times higher than 2016 fundraising levels.³

While public and private investment to fund the energy transition is growing, the scale of required economic transformation for the net-zero transition remains significant. Between 2021 and 2050, cumulative capital spend on physical assets to accommodate the net-zero transition is estimated to be as much as \$275 trillion.⁴ Certain proven climate technologies lack access to appropriate funding sources that will enable their ability to scale.

Furthermore, financing growth through equity is not always the most appropriate solution. When certain conditions exist for a business to scale-up such as a demonstrated track record, clear market fit, and reliable revenue contracts in place, debt financing can be a non-dilutive solution and attractive alternative to growth capital via equity.



Currencies in this article are in USD, unless otherwise stated.

¹ Compared to 2021 levels. Preview: [What would it take to scale critical climate technologies?](#) | McKinsey

² [Net Zero by 2050 – Analysis](#) - IEA

³ [Voluntary carbon credits set for COP28 review amid rising investor interest in emission-reduction strategies](#) (prequin.com)

⁴ [The net-zero transition: Its cost and benefits](#) | Sustainability | McKinsey & Company

Climate technology straddles tech and real assets

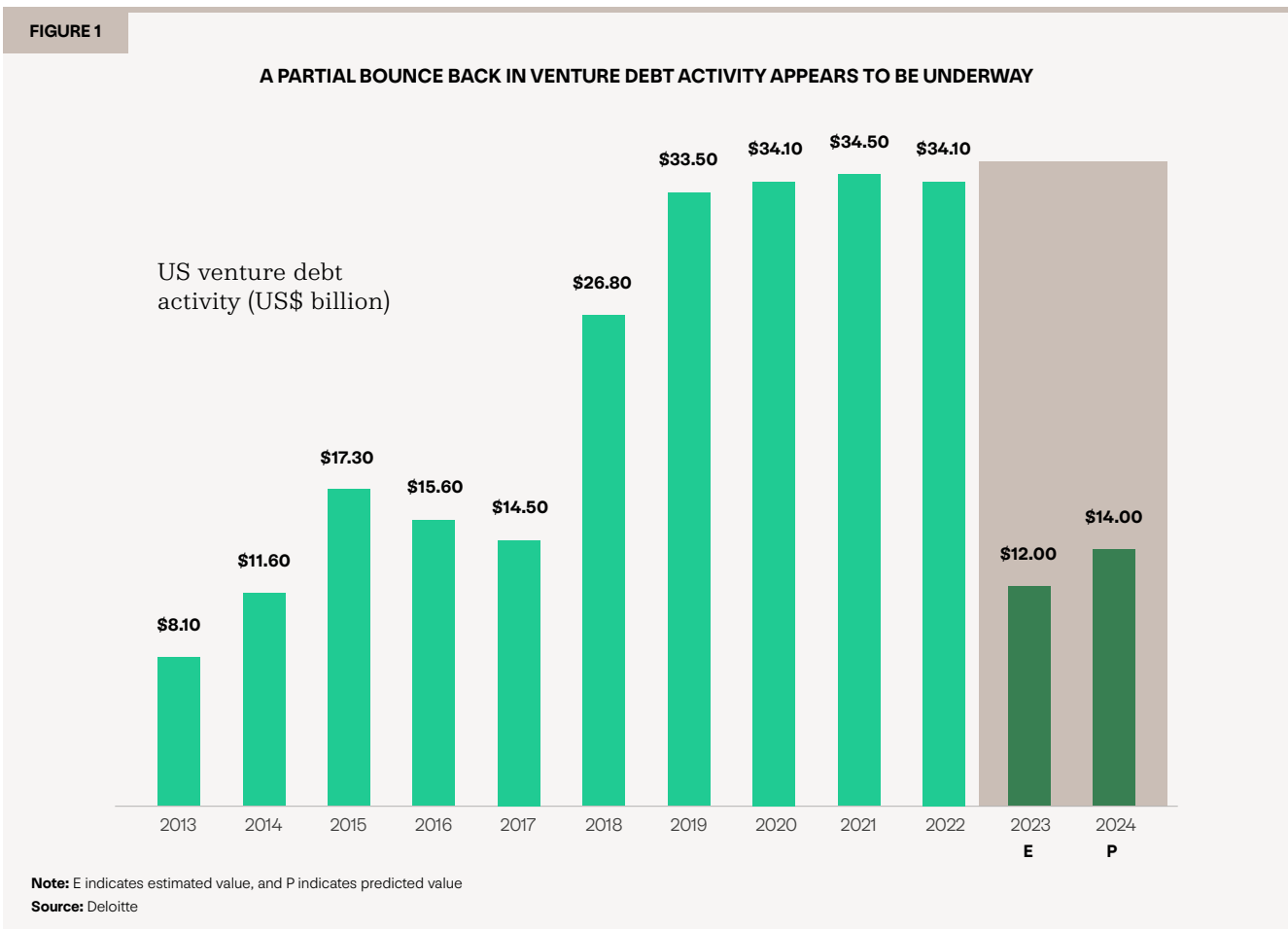
Historically, climate technology has largely sourced its funding from private equity and venture capital investors. But headwinds in the macroeconomic environment have resulted in a slowing of private equity investment over the last 12 months – a trend to which climate technology has not been immune.

A combination of geopolitical turbulence, inflationary concerns, persistently high interest rates, and technology disruption has led to a severe slowdown in private equity transactions during 2023. With tighter financial conditions causing trepidation among investors, the number of private equity exits fell to its lowest level in five years in March 2023.⁵

In venture debt, the outlook has also been murky, particularly since the collapse of Silicon Valley Bank. In the US, venture debt activity for 2023 closed at \$12bn (just over a third of 2022 levels).⁶

In the climate technology sphere, venture capital and private equity funding plunged to its lowest level in Q2 2023 since early 2021.⁷

This slowdown in private equity and venture capital has helped create an attractive market opportunity for scale-up debt capital to increase investment in climate technology.



⁵ Private equity exit deals reverse course, slump to five-year low in FY23 (vccircle.com)

⁶ Technology venture debt | Deloitte Insights

⁷ BloombergNEF

Three other factors contribute to this supportive environment:

- 1 Climate technology investors made significant allocations in the years leading up to 2023, meaning they now find themselves without dry powder in a difficult fundraising environment with significant outstanding exposures. In other words, they have “picked their horses,” and the ability to invest further is limited, which reduces competition in the market.⁸
- 2 Given the prominence of digitisation over the past decade, venture capital firms’ experience is rooted in industries where company valuations are largely based on software. Therefore, they are often less well placed to invest in capital-intensive, infrastructure-like businesses whose valuations are more heavily based on real assets.
- 3 The benefits of myriad support provided to climate technology opportunities through the Inflation Reduction Act in the United States are yet to fully manifest. We believe this government spending will continue to improve opportunities in climate technology for the years to come.

These factors create an opportunity for debt investors to finance climate technologies, which is enhanced by experience in real asset underwriting. Many climate technology businesses are capex-intensive and require a deep understanding of infrastructure and its adjacent sectors, with a view on how the next generation of infrastructure will interact with the existing built environment. This gap is not currently well-addressed in the market, representing an opportunity for investors with infrastructure expertise.

The growth credit funding solution

As the economy emerges from an extended period of suppressed interest rates, certain climate technology companies find themselves at a precarious nexus. Having proven their technologies’ use case, they benefit from the extensive research and development that has been fuelled by the attractive investment environment of the last several years.

Growth credit funding represents an opportunity to build financing relationships over the long term, alongside management teams and sponsors.

Simultaneously, however, they lack reliable, longer-term funding in an environment where traditional sources of growth capital remain uncertain.

This paradigm has crystallised the opportunity of funding the next phase of growth via debt capital, rather than equity. For investors, this is an opportunity we refer to as “growth credit”.

Unlike venture (or opportunistic) debt, the growth credit solution does not apply selectively to short-term horizons. Growth credit funding, rather, represents an opportunity to build financing relationships over the long term, alongside management teams and sponsors seeking to scale their proven technologies and processes in a less dilutive fashion than equity. Growth credit, therefore, may be considered a strong supplement for companies looking to diversify funding sources and scale in a non-dilutive fashion before accessing broadly syndicated capital markets.

For institutional investors already exposed to several vintages of growth equity across fund managers, growth credit can serve as a diversifying strategy that is more senior to equity in the capital structure with security over valuable assets and intellectual property. With respect to returns, while growth equity potential is determined by its ability to exit at a higher valuation (which is generally correlated to public market conditions), growth credit represents an opportunity to deliver compelling risk-adjusted returns in the mid- to high-teens through senior secured debt investments that provide fixed return with significant downside protection for investors.

⁸ Macro market freeze chills climate tech: Venture funding down 40% in H1 2023 (ctvc.co)

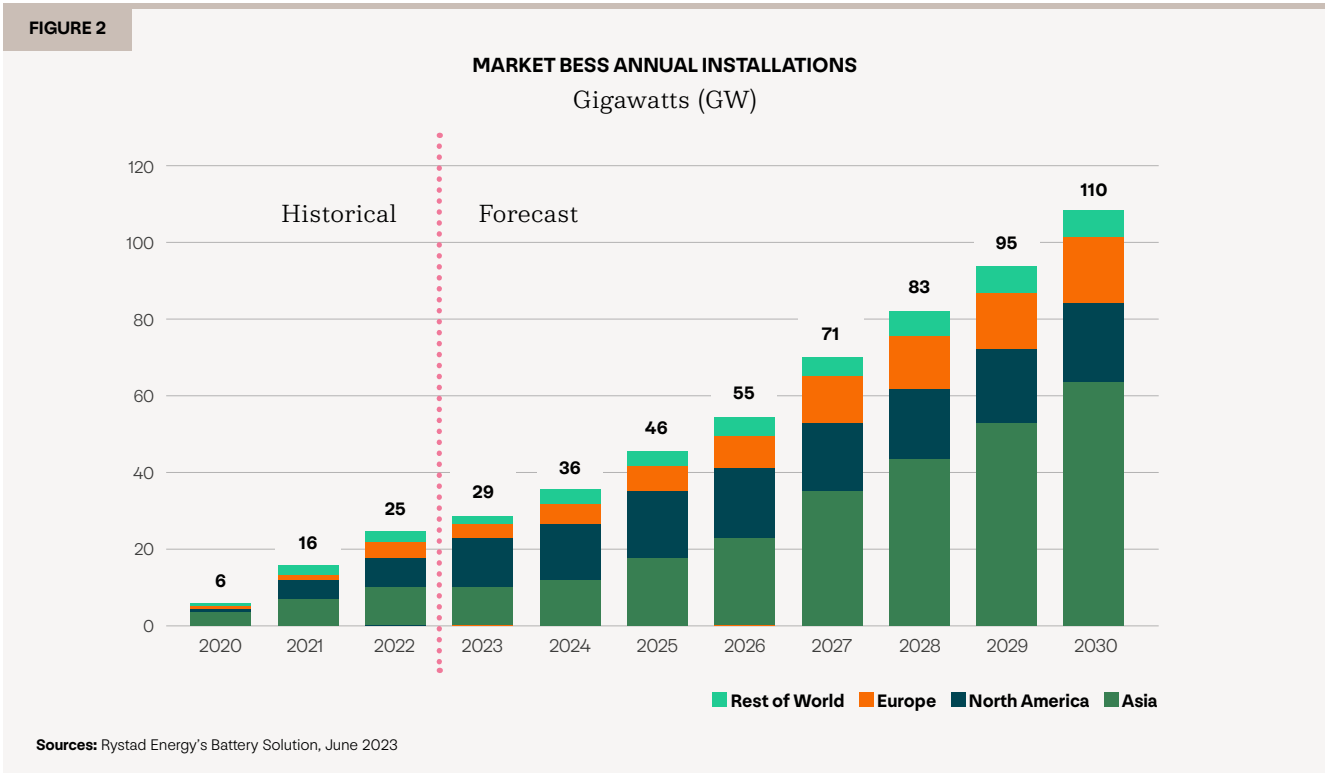
Spotlight On BESS

One of the climate technology solutions that is considered critical to the energy transition is Battery Energy Storage Systems, also known as “BESS.” These are battery storage power stations that store renewable electricity when there is excess supply, to be used during periods of peak demand when intermittent resources such as wind and solar are not available. Battery storage represents an interesting example of the climate technology continuum, where there are both developed and nascent opportunities for investment. Battery storage for under eight hours of deployment has commercialised swiftly and now benefits from traditional sources of project financing. Longer-duration applications for storage over eight hours, on the other hand, is a more nascent technology that requires bespoke funding solutions in order to scale effectively.

Both established and nascent forms of BESS address key challenges in the energy transition: intermittency. For periods of low irradiation and wind, battery storage solutions facilitate efficient

storage and grid supply, stabilising the distribution network and reducing consumer costs.⁹ These represent key milestones to secure not only the green energy transition, but also the ability to strengthen national energy security initiatives.

Appetite for the technology is therefore increasing rapidly. BESS achieved over \$5bn in investment during 2022 alone, representing a threefold increase from 2021, and the market is expected to reach up to \$150bn in investment globally by 2030. Meanwhile, costs related to BESS are falling as the technology matures. According to the International Renewable Energy Agency (IRENA), battery storage costs have fallen rapidly due to economies of scale and technology improvements. As an example of the cost decline, in Germany small-scale household Li-ion battery costs have fallen 60% since 2014. Looking ahead, total installed costs for BESS are expected to fall between 50% and 60% by 2030, driven by optimisation of manufacturing facilities and improved use of materials.¹⁰



⁹ The rise in popularity of battery energy storage systems (BESS) (marshcommercial.co.uk)
¹⁰ Battery storage and renewables: costs and markets to 2030 (irena.org)

Furthermore, co-locating BESS with solar or wind assets drives cost savings with respect to grid connection, overhead, and network charges.¹¹ Solar, specifically, demonstrated the largest absolute generation growth of all renewable technologies in 2022 and maintains a leading position as the power generation technology with the most investment.^{12,13} But in order for the grid to benefit from energy produced from solar assets when the sun is not shining, the energy needs to be stored in batteries for later use. Due to its real asset nature and the demonstrated use case of the technology, co-located solar and BESS technology represent ripe opportunity for infrastructure investors seeking to invest along the continuum of nascent to established climate technology solutions.

IFM has already begun investing in the more commercialised application of BESS through its infrastructure equity and debt platforms and would consider some of the burgeoning BESS companies and technologies as part of the “growth credit” universe. We are enthusiastic about battery storage opportunities on the horizon and what they mean for the decarbonisation agenda.¹⁴ Utility-scale BESS

will be paramount to accommodating a wide range of services in the next generation infrastructure ecosystem, offering tremendous deployment and cost-reduction potential over the coming years.



Ausgrid battery, Australia

Pairing the right capital with the right opportunities

While changes to our climate may pose significant risks to investment portfolios, they also represent a vast opportunity set. The world faces a seemingly insurmountable investment gap to reach net zero by 2050, but we are in a position to reduce global human-made emissions by 90% just by scaling the climate technologies that exist today.¹⁵

In summary, there exists a broad array of climate technology solutions that are inherently interconnected (and for which the stages of development are currently uneven). While some are already commercially competitive, others require additional innovation and scale-up. By pairing the right capital with the right opportunities, we believe investors with expertise in real assets and infrastructure are well-poised to accelerate decarbonisation along the continuum of climate technology solutions.

¹¹ [Why is battery colocation not scaling in Europe? | Timera Energy \(timera-energy.com\)](https://www.timera-energy.com)

¹² [IEA - Solar PV](https://www.iea.org)

¹³ [IEA - World Energy Investment 2022: Overview and key findings](https://www.iea.org)

¹⁴ [BESS Capacity Tracker - March 2022 - Rho Motion: New battery storage capacity to surpass 400 GWh per year by 2030 \(rystadenergy.com\)](https://www.rystadenergy.com)

¹⁵ [What would it take to scale critical climate technologies? | McKinsey](https://www.mckinsey.com)

Indiana Toll Road



Tom Osborne
Executive Director,
Infrastructure

How the US Inflation Reduction Act is reshaping the investment landscape

The US Inflation Reduction Act is leading the world in showing how to accomplish a just transition, boosting domestic manufacturing, creating jobs with good pay, and reducing carbon emissions across one of the world's largest economies – all while unleashing significant investment opportunities for asset owners.

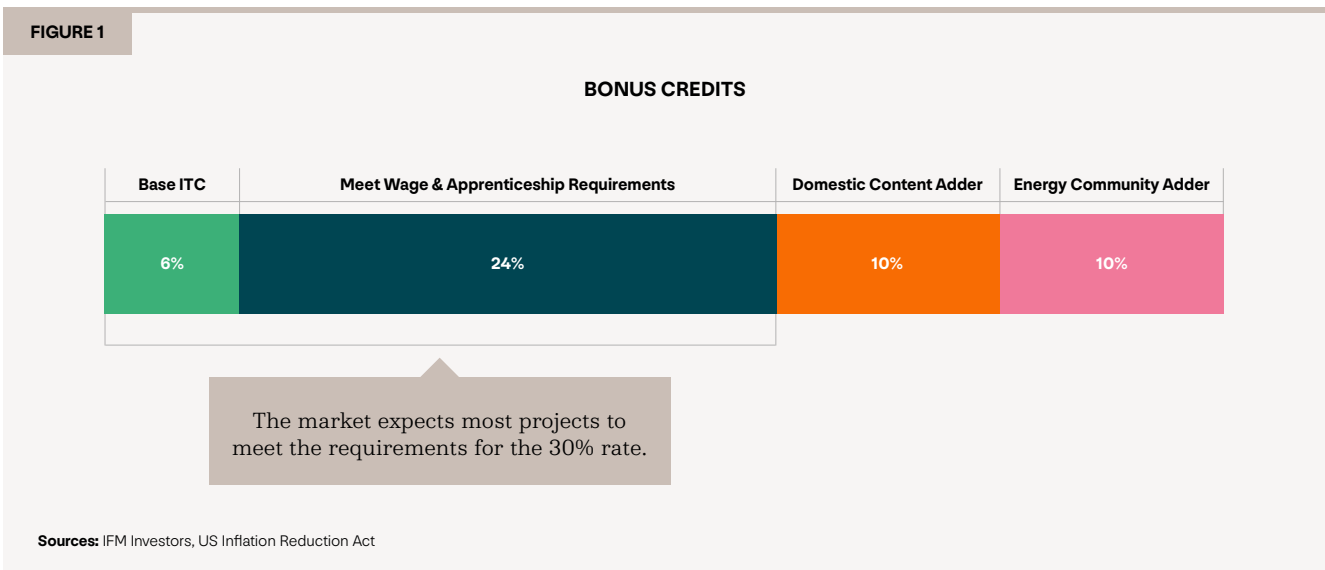
Following decades of decline in public infrastructure spending and the failure of successive US Administrations to properly address the funding shortfall, President Joe Biden’s flagship Inflation Reduction Act (IRA) was heralded as a welcome investment in the future of US renewables, manufacturing and skills and training.

The \$1.2trn¹ IRA and companion Infrastructure Investment and Jobs Act (IIJA) are the envy of many countries, helping the private sector deliver the energy transition the US requires while promoting a just transition that delivers apprenticeships and well-paid jobs. However, it initially drew the ire of some commentators outside the US over concerns it would unduly distort the flow of private capital. Re-adjusting the US investment tax credit (ITC) to a base rate of 6%, rather than 30%, projects are now instead rewarded with a 24% bonus credit where they meet wage and apprenticeship requirements – with the ITC rising as high as 50% depending on an investee’s ability to draw on local steel, iron and other goods. As a result, IRA-eligible projects immediately became more attractive to build stateside than nearly anywhere else in the world, placing the emphasis on the private sector to make investment decisions capturing the value of tax credits for their investors, rather than applying for the government grants offered through the IIJA where a successful application was not guaranteed. Additionally, the qualification period’s extension to 10 years meant

projects had a level of certainty previously not associated with tax credits, where yearly extensions of the program by Congress were common.

At IFM Investors, we regard ourselves as well-positioned to attract the debt funding and benefit from the tax equity financing associated with ITCs and estimate that returns could improve significantly where projects are able to benefit from the domestic content and energy community ITC. However, the complexities associated with the new wage and apprenticeship requirements mean new programs need to be launched locally to comply, causing a delay in how quickly projects can benefit.

It is hard to overstate the impact of the IRA. From the \$739bn total funding under the IRA, \$369bn will be provided for clean energy and climate investment, including tax incentives for investments in renewable energy, decarbonisation, and energy security. Making the US a highly attractive investment destination was a stated goal of the legislation (as well as the broader economic program – ‘Bidenomics’, for short). The IRA has led to significant investment inflows into the US, estimated by the White House at \$110bn one year after its ratification.² However, as it has shifted the weight of investment decisions towards the US, it has led to concerns of protectionism, which the US Administration has addressed by opening up the benefits of the Act to other friendly nations and jurisdictions, such as those within the European



¹ Currency is in US dollars unless otherwise stated.

² [FACT SHEET: One Year In, President Biden’s Inflation Reduction Act is Driving Historic Climate Action and Investing in America to Create Good Paying Jobs and Reduce Costs | The White House](#)

single market, Australia and those with which the US enjoys free trade agreements.

The IRA's introduction nevertheless resulted in calls from parliaments across the world for similar targeted tax breaks and subsidies to ensure each country's domestic manufacturing base and private capital otherwise attracted to it did not focus entirely on projects in America and could be similarly turbo-charged.³

Rush to subsidise

The European Commission, itself overseeing a raft of legislation meant to bring about the European Green New Deal, has come under pressure since passage of the IRA to relax its strict state aid rules, which advocates believe would allow member states to better counter its impact. The suspension of the rules against state aid would allow a potentially impacted member state to match subsidies with those the project would otherwise receive in the US. Additionally, the Commission's proposed Green Deal Industrial Plan would streamline planning rules and allow EU member states to take on greater debt to fund the required green transition.

However, relaxation of state aid rules does not provide the same certainty as dedicated funds. Critics argue such relaxation would disproportionately benefit Germany and France, the bloc's largest member states.

To balance Germany and France's dominance, the European executive has been weighing up the launch of a Sovereignty Fund that would "crowd in" private investments. It would be unlikely to match the impact of the significant tax credits granted by the IRA unless any state-owned stake was only used to absorb any downside risk, rather than benefitting from the upside.

Similarly, Japan passed the Green Transformation Act in May 2023 which leverages the government's borrowing to support private sector projects the government deems would struggle to otherwise attract funding. The ¥150trn (US\$1trn) estimated spending over the coming decade compares favourably to the planned overall cost of the IRA,



especially once accounting for the economies' respective sizes. However, unlike the IRA, the funds will be spent in Public-Private Partnerships rather than by allowing investors to reduce the risk of projects through tax credits.

The transferability of tax credits

Benefits of investing under the IRA principally stem from the allocation of the tax credits – but also the ability to trade those credits if they are not fully utilised by the company that qualify for them. As the IRA is set to support the growth of renewable energy and other, newer climate change mitigation technologies, many projects taking advantage of the tax credits will be start-ups with little-to-no tax to pay. These entities may now trade their tax credits on the open market and bring forward their benefit by several years, thus further improving potential returns.

While a typical tax equity scheme allowed project tax credits to be acquired by another entity, a specific allowance in the Act for transferability of credits greatly widens the field of buyers for those projects. As a result, the broader market means credits can be sold faster and on more favourable terms. Credit Suisse estimated that the tax equity market will grow to \$49bn in 2024, a near doubling compared to 2022, and overall trade in tax credits will reach \$500bn in the decade since the Act's introduction.⁴

³ Cooperation with the US could drive Australia's clean energy shift – but we must act fast | Climate Council

⁴ Credit Suisse Treeprint Inflation Reduction Act

Prospects for pension capital

Ultimately, the large-scale rollout of renewable energy generation and transition to net zero will not be successful unless private, long-term capital can be deployed to support and accelerate the transition. This sustained investment can come from a number of places, but notably, pension funds will be a key source of this patient capital.

As in many other countries shifting from a centralised energy system to one where renewable projects are less geographically clustered, new transmission lines will be needed to ensure the green energy is delivered to consumers. This will lead to

investment opportunities both in local grid upgrades and expansions, as well as new transmission interconnections.

Additionally, in line with the rise in popularity of the electric vehicle, investors are being encouraged to step up to fund the construction of charging infrastructure. Where in some jurisdictions governments have stepped in to commit the first capital for such charging infrastructure – in part in an effort to alleviate the range anxiety associated with EVs – a rollout that properly covers a country as large as the US will need significant private capital.

CASE STUDY



Double Black Diamond solar project

The 800 MWdc (593 MWac) Double Black Diamond solar project is set to be the second largest single-phase solar project built in the US once it is complete in 2024.

Commissioned by Swift Current Energy, which is majority owned by IFM portfolio company Buckeye Partners, it will produce enough energy each year to power the equivalent of more than 100,000 homes and reduce carbon dioxide emissions by approximately one million tonnes per year.

The project financing, which closed in August 2023, included \$695m in construction and tax equity bridge loans and an \$84m letter of credit facility, making it one of the largest project financings ever for a US solar project. The tax equity component sees the project directly benefit from the investment tax credit bolstered by the IRA, with the tax equity market where these are traded forecast to nearly double to \$40bn a year by 2030 due to the reforms.

Credit: Wood Mackenzie

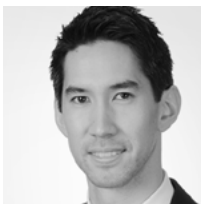
Conclusion

As shown in the Double Black Diamond case study, the IRA not only allows investors to benefit from the transferability of tax credits, but it should also ease the investment risk associated with a range of renewable energy projects.

Overall, the IRA increases the potential returns for many climate-aligned and transition-friendly projects and is already driving immediate investment in both production and energy generation – creating a decade of policy certainty by expanding tax credits to a broad range of green and renewable projects in need of funding. From that perspective, the legislation is, arguably, unprecedented.



Vienna Airport, Austria



Aaron McGovern
Executive Director,
Infrastructure



Vivien Cheung
Vice President
Infrastructure

Driving out emissions:

Decarbonisation of the transport sector

From airports to toll roads and seaports, the pathway to net zero relies on technological change – and the right policy settings to support investment.

In facing the global challenge of decarbonising the economy, many will think of the transition away from energy generated by the combustion of fossil fuels, which is responsible for over 40% of global carbon emissions.¹ Significant investment is being poured into clean energy and the electricity sector, with investment exceeding \$1trn for the first time in 2022 and projected to increase further to \$1.2trn in 2023, with over \$1trn flowing into renewables and grids alone.²

The transport sector is also a major emitter and accounts for over one fifth of global carbon emissions, so there also needs to be attention paid to this sector and to how public transport, airports, toll roads and seaports can reduce their carbon footprint. Decarbonising these assets requires an understanding of current and emerging technologies and their trade-offs. Most of all, decarbonisation requires cross-sector collaboration.

Infrastructure investors can play an important role in reducing emissions by working with the operators of heavy-emitting assets to transition the assets and support sector-wide decarbonisation. Many of these transitions will require significant investment in new technologies, such as those to enable the production of new fuels or the efficient charging of autonomous and electric vehicles. At IFM Investors we have long invested in airports, seaports and toll roads, and we have begun transitioning these assets to be ready for the low-carbon future.



Sydney Airport, Australia

Airports

Although aviation accounted for only 2% of global energy-related emissions in 2022, the sector's emissions are increasing faster than those from rail, road and shipping.³ Demand for air travel continues to recover after the COVID-19 pandemic and longer term, population growth and an increase in the number of middle-class consumers in developing nations will support higher demand for air travel. All this points to rising aviation emissions this decade – and growing pressure on airports and airlines to invest in decarbonisation technologies.

Aviation has been described by the International Energy Agency as 'one of the most challenging sectors to decarbonise'⁴, with limits on what can be achieved through shifts to hydrogen fuel and electric planes. With stringent aviation authority testing requirements and long fleet renewal cycles⁵, it is also unlikely that significant engine and airframe innovation will be seen in the near term. Given these constraints, increasing the availability and price competitiveness of Sustainable Aviation Fuels (SAF) is the most viable near-term path to decarbonising aviation.

While the decarbonisation of aviation is likely to require a combination of multiple technologies, including engine and aircraft advancements, electrification, and hydrogen, the majority of emissions reductions required for the aviation industry to meet its net zero by 2050 targets is expected to be achieved through SAF. In part, this is due to the compatibility of SAF as a 'drop-in' fuel, allowing it to be blended 50:50 with traditional jet fuel and used in service today without significant alterations to existing aircraft engines and refuelling infrastructure. SAF is currently produced using costly and finite biogenic feedstocks, resulting in low availability and exposure to commodity markets which make SAF prices typically several times costlier than traditional jet fuel. Close collaboration between airport owners, airlines, governments and energy companies is therefore required to sustainably increase the scale and price competitiveness of SAF if aviation sector emissions are to be reduced in a timely manner.

Currencies in this article are in USD, unless otherwise stated.

¹ IEA (2023), *Greenhouse Gas Emissions from Energy Data Explorer*, IEA, Paris.

² 2022 IEA data, *Electricity - Energy System* - IEA.

³ International Energy Agency (2023), 'Aviation'.

⁴ Ibid.

⁵ McKinsey & Company, (2023), 'Decarbonizing aviation: Executing on net zero goal.', 16 June 2023.

Sustainable Aviation Fuel

Certified for use in commercial jet aircraft, SAF meets greenhouse gas and other sustainability criteria. Unlike traditional jet fuel made from fossil fuels, SAF can be made from a range of renewable feedstocks, including vegetable oils, sugar crops, waste oils, municipal wastes and agricultural wastes. SAF costs remain significantly higher than those of traditional jet fuels while demand for it far exceeds supply.

IFM has engaged global consultants to aid our understanding of how global airport operators are responding to Scope 3 emissions produced and controlled by airport tenants, airlines, ground-access vehicles and other airport stakeholders. We have also contributed to discussions on the policy frameworks to incentivise SAF production in countries including the UK and Australia.

The chief executives of Manchester Airports Group and Brisbane Airport are also active members of the Jet Zero Council and Australian Jet Zero Council, respectively. The councils are partnerships between government, academia and senior stakeholders from across the aviation sector and its supply chains that have been set up to work with industry to inform the design of policy settings to encourage emissions reduction in the aviation industry, provide senior industry leadership, and promote, mobilise and galvanise industry efforts to decarbonise aviation.

In the UK, the Jet Zero Council has a specific target to deliver at least 10% SAF in the UK fuel mix by 2030, and zero emission transatlantic flight within a generation.

In the US, the Sustainable Aviation Challenge has set a goal for airlines to use 11 billion litres of SAF – about 15% of current fuel demand – by 2030.⁶ The US Inflation Reduction Act of 2022 included a two-year tax credit for those that blend SAFs and a three-year tax credit for SAF producers.⁷ The US also provided a \$297 million grant program for SAF projects, among other initiatives.

Under the RefuelEU initiative, the European Commission announced an obligation for all local aviation fuel suppliers to provide aircraft operators with minimum levels of SAF and synthetic fuels, with the percentage of supplied SAF gradually rising from 2% in 2025 to 70% by 2050, with a similar escalation capped at 35% in 2050 planned for synthetic fuels.⁸

In November 2023, IFM announced that it would be conducting feasibility studies that explore the use of agricultural feedstocks to produce SAF in Australia, through long-term domestic feedstock supply including waste and residues, crop-based oil, and bio-organics. IFM has partnered with leading Australian agribusiness and processing company, GrainCorp Limited, on this important initiative.

⁶ International Energy Agency, (2023), 'Biofuel'.

⁷ US Government (2022), 'SAF Grand Challenge Roadmap', September 2022.

⁸ RefuelEU aviation initiative: Council adopts new law to decarbonise the aviation sector

Toll Roads

For toll roads, it is widely accepted that electric vehicles (EVs) are the key to decarbonising road transport, which comprised approximately 17% of global carbon emissions in 2021. Toll road owners must ensure their infrastructure can accommodate a critical mass of EVs (which is projected to be reached within 10-15 years).⁹ This will require significant investment in extensive charging infrastructure and potentially other technologies that help charge EV batteries while they are driving along the toll roads. Such a rollout could be challenging in countries such as the US and Australia, where sparsely populated regions occasionally give way to significant metropolitan hubs, lacking the population and user density in many regions to warrant such an investment. Government policies, including incentives for EV owners to install charging points at home and changes to building codes to require new construction or substantial remodels to include charging points, have supported the prevalence of

private charging (at home and at the workplace). While the development of new battery technology is expected to reduce the additional demand for charging stations, consumer sentiment towards EVs will still rely on the knowledge that there is broad accessibility to reliable charging networks.

Many toll roads have already rolled out rest-stop charging stations, and this early adoption of convenient and efficient charging infrastructure may become an important point of differentiation among toll roads as the adoption of EVs increases. Current global trials include overhead charging rails that can charge vehicles as they move through the corridor and contactless wireless-charging concrete highway pavement. For example, Dynamic Wireless Power Technology (DWPT) uses coils positioned under asphalt to transfer energy directly to electric cars and buses (see case study). If proven viable, DWPT could see toll road owners replace existing asphalt on roads or introduce it to new projects.



⁹ Have booming EV sales crossed the mass-adoption tipping point? (energymonitor.ai)

CASE STUDY



Building the world's first EV-charging highway

IFM has invested in the trial of Dynamic Wireless Power Technology (DWPT) in Italy through Aleatica, its fully owned transport infrastructure operator that focuses on the design and operation of highways in Europe and Latin America.

Aleatica is part of a collaboration that has developed 'Arena del Futuro', a 1050-metre-long circuit that uses DWPT to charge EVs wirelessly. EVs are driven in wired lanes that have a system of coils installed under the asphalt to transfer energy directly to electric cars and buses as part of the trial.

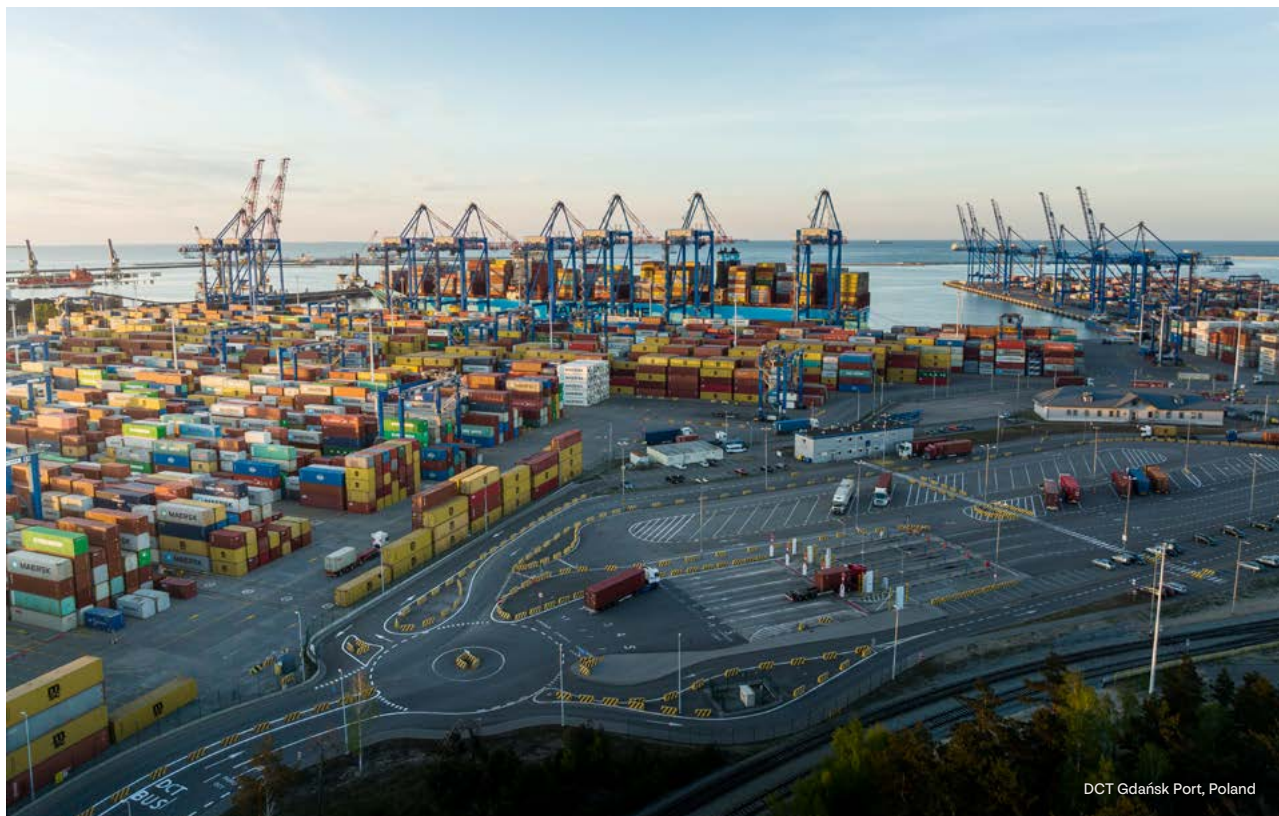
The long-term potential is EVs being charged as they drive on a highway. Through a special receiver, EVs would receive energy from the road infrastructure directly to their electric motor – a revolutionary change for EVs.

If successful, this technology could extend the EV's range and conserve its battery. Tests have shown an EV can travel at normal speeds on the circuit without using its battery energy storage, and that the rate of energy transfer is comparable to that from fast-charging stations.

For some people, battery-range anxiety and concerns about available charging infrastructure are impediments to buying an EV. Knowing their EV is being charged as it's driven on a highway commute could ease their concerns.

DWPT could also aid the development of autonomous vehicles over time. At this stage, the batteries in trucks are too heavy for long-distance freight. As battery technology advances and significant investment and research goes into testing alternate low emissions fuel (such as hydrogen), the advent of self-driving trucks could, for example, improve truck productivity by reducing the number of stops required and enable self-driving trucks to travel longer distances in between refuelling or charging. Trucks may also be able to run overnight with an attendant, releasing capacity during the day for passenger vehicles and deliver safety outcomes.

Like other road-electrification projects, the Arena del Futuro Project is still at an early test stage. But the potential environmental and efficiency gains from charging EVs as they drive on electrified roads is significant – and another way technology could quicken the decarbonisation of toll roads.



DCT Gdańsk Port, Poland

Seaports

International shipping accounted for 2% of global energy-related carbon emissions in 2022. Ships, on average, emit less carbon (per tonne and kilometre) than air transport, rail or trucks that move bulk cargo. However, the majority of international goods trade is moved by ships and most large vessels almost entirely use oil-based fuels.¹⁰

There is significant consumer interest in carbon-neutral shipping, according to Boston Consulting Group. In surveying 125 shipping customers in 2022, it found 82% were willing to pay a premium for zero-carbon shipping, an increase of 11 percentage points over the prior year. The survey further found that a carbon-neutral shipper would enjoy greater customer loyalty.¹¹

Like airports, ports have an important role in providing infrastructure and incentives to support the decarbonisation of fleet vessels. One way in which ports are using new technologies to decarbonise their operations is by providing renewable energy to vessels that call. This practice,

known as ‘cold ironing’, involves ports providing shoreside electrical power to ships while they are berthed, allowing them to turn off their main and auxiliary engines and avoid burning fossil fuel. While it is often not feasible to provide 100% of the energy needs of vessels through cold ironing, the practice can significantly reduce the Scope 3 emissions of ports.

Additionally, there is a significant decarbonisation opportunity for ports in facilitating the refuelling of vessels with alternate, low emission fuels. Fleet order books for major shipping lines are increasingly trending towards ships powered by alternate fuels, including hydrogen, LNG and green methanol. With these different fuels will come differing safety, environmental and technological requirements for portside refuelling infrastructure where shippers choose to refuel. As these trends develop, we will work with our port assets to evaluate new opportunities.

¹⁰ International Energy Agency (2023), ‘International Shipping’.

¹¹ Customers’ Willingness to Pay to Decarbonize Shipping, BCG.

Aligning opportunity with policy settings

Operational trade-offs with decarbonisation are an important consideration. Airports have much to gain from greater use of renewable energy and through fuel supply models that facilitate and incentivise use of SAF. At the same time, as critical high-throughput assets, airports must continue to function efficiently and safely during this transition to decarbonisation.

Toll road and port owners need to weigh up the long-term benefits of investing in renewable technologies and growth in EVs. A multi-billion-dollar investment in new charging technology and charging stations might not be feasible on a toll road if the uptake of EVs is too slow.

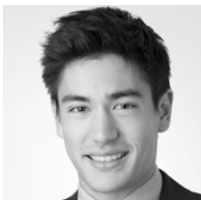
Policy settings are also key. For example, encouraging greater adoption of SAF to support the decarbonisation of the aviation industry will require governments to provide policy settings and signals that encourage the use of domestically grown feedstock and stimulate investment in local refining capacity. Governments, too, must ensure they have the right policy settings to encourage investment in technology for toll roads and seaports.

On balance, IFM and other owners of transport infrastructure must weigh up multiple short- and long-term considerations when investing in new technologies to decarbonise assets. They must seek to maintain their mandated target returns from transport investments in line with investor expectations, while ensuring these assets continue to serve society, amid population growth and changing community needs and expectations about climate change. They must also consider the risk of not decarbonising fast enough. Assets that do not decarbonise are likely to face a backlash from consumers who may favour lower-carbon transport options or increased compliance costs.

Collaboration and stewardship are vital, and to that end we will work with governments and a range of other stakeholders to advocate for the kinds of policy settings that allow for the timely investment of capital to achieve the desired low-carbon future.



Kittredge Zuk
Executive Director,
Asset Management,
Infrastructure



Timothy May
Investment Director,
Infrastructure

Enhancing the customer experience at infrastructure assets

Infrastructure assets play a vital role in the overall quality of life for people and are important in facilitating economic growth. However, expanding capacity to meet growth demands, maintaining ageing infrastructure, and providing a seamless customer experience consistent with contemporary expectations while enhancing sustainability can be a challenge due to limited public funding.

As long-term stewards and private owners of infrastructure assets, IFM Investors takes an active asset management approach to manage these challenges. Specifically, as an open-ended fund, IFM is well-suited to fund growth while investing capital to maintain the asset and enhance customer experience and sustainability.

We devote significant resources to understanding and mapping key priorities and needs for the stakeholders in the infrastructure assets we manage, with customers being one such group. Through this exercise, we can build our social license to operate and, ultimately, drive returns. When it comes to customers, we seek to understand their expectations now and in the future and help ensure our assets can continue to add value to their journeys.

We believe a targeted effort to enhance our customer experience is fundamental to delivering attractive, long-term risk-adjusted returns from infrastructure. Positive customer experience can drive greater throughput through our facilities, less time queuing or in traffic and more time for our customers to spend at our retail facilities and with loved ones. Alternatively, poor service at the toll booth or slow traffic on a toll road could be the reason a customer decides to take the non-tolled alternative for their next trip, or a poor food and beverage offering or long lines at security could mean a customer flies through a different airport for their next holiday.

With these dynamics in mind, at IFM we consider what customers need now and in the future and how infrastructure assets will need to change and the capital required to meet those needs. This approach can reduce risk by 'future-proofing' assets against expected change and create value for our clients and owners who entrust us with their capital.

Changing customer expectations

On toll roads, customers want better technology to plan their trip, digital payment options and greater ability for self-service on toll-road websites. Enhanced road signage, lighting and road surfaces further add to the customer experience by improving safety for users. Longer term, toll-road customers will need additional charging capacity for electric vehicles (EVs) and better connectivity on roads to enable advanced technology and self-driving vehicles.

For households with rooftop solar, there is an increasing desire to store excess solar energy to use during peak times. Through IFM's investment in Ausgrid¹, the largest distributor of electricity on Australia's East Coast, we are participating in the roll-out of medium-size community batteries.

Digitisation is also transforming service delivery and the customer experience. At airports, new technologies are enhancing passenger security and safety; making terminals easier to navigate and more convenient for customers; and driving airport efficiency gains through automation.

All of these require significant investment but are the key to consistently improving customer experience as demand for infrastructure assets grows.



Ausgrid, Australia

Currencies in this article are in USD, unless otherwise stated.

¹ IFM Investors owned 25.2 per cent of Ausgrid at 30 June 2023.



How our portfolio assets are able to improve customer experience and drive demand – a focus on toll roads

By engaging with stakeholders and making improvements aligned to the most material aspects for key stakeholders, we believe we can grow our social license to operate, position ourselves as a partner of choice and enhance our customers' expectations while creating value for clients and owners.

IFM's global infrastructure portfolio asset Aleatica, looks to provide smart, safe and sustainable critical transportation infrastructure via 16 toll roads across 7 countries², backed by cutting-edge technology that anticipates customer needs.

One of the ways in which Aleatica has been able to improve the customer experience is through the implementation of reversible lanes in Mexico, first at Viaducto Bicentenario, and most recently the reopening of one at its Supervia Poetas concession. The reversible lane has significantly reduced travel time in the region it services, Santa Fe, by up to 30%, led to a 9% reduction in customer complaints

in 2023, and increased revenue. With a payback period of only two months for the investment in the reversible lane, this is a clear example of the alignment between positive customer experience and returns.

In order to increase demand and improve the overall customer experience, a number of IFM's global infrastructure portfolio toll road assets have been engaged in tolling enhancements.

At M6toll, Aleatica's newest concession business in the UK, the company is implementing an automatic number plate recognition (ANPR) system with the capability to capture license plate data and facilitate contactless and cashless payments for account customers. This new system, coupled with a new customer relationship management and eCommerce system, will ensure smooth and efficient operations and improved customer service for the 50,000 drivers that use the road each day.

Likewise, in 2023, the Indiana Toll Road (ITR) completed a multi-year and multi-million dollar investment to upgrade its In-Lane tolling and payment systems. This new platform now speeds up toll collection, provides motorists with additional

² Aleatica is a transport infrastructure operator that focuses on the design and operation of highways in Europe and Latin America. It holds interests in 20 concessions in total (16 toll roads, 2 ports, 1 light rail system and 1 airport).

payment options, and keeps everybody moving toward their destinations. Integration of “tap-to-pay” features is expected to save users between 40–75% more time, compared to swiping their cards.

In addition to tolling and reversible lane technologies, our toll roads have also been focused on increasing their service level via improving the asset condition and safety for users.

At ITR, the company has repaired approximately 75% of pavement lane miles and 27% of bridges since IFM’s acquisition in 2015. Most recently, in November 2023, ITR completed a \$70m construction project to restore an additional 18 bridge structures. The company worked hard to avoid inconveniencing its customers and traffic reductions that can occur during maintenance and construction periods by placing a great emphasis on efficiency. Ultimately, ITR achieved its aim of an accelerated time schedule – completing a two-year effort in less than a year. In addition, maintenance employees provided backup

support for on-site safety and queue-detection systems, alerting motorists to active construction through dynamic messaging.

At Connex, one of Aleatica’s Mexican concession companies, the business entered into a new amendment (in 2020) with the grantor in order to establish improved standards of safety, quality of service for customers and an enhanced sustainability program for neighbouring communities. In return, the business was able to increase tariffs for its heavy vehicle customers while simultaneously reducing rate increases for its light vehicle customers, providing a more aligned payment structure for customers.

Another trend in customer demands in the toll road space is in relation to EV charging infrastructure. Aleatica’s A35 Brebemi motorway is piloting an innovative inductive charging lane, to allow customers to continue their journey while charging their vehicle (Case Study 1).

CASE STUDY 1

Arena del Futuro: An Innovative Commitment to Zero Emissions Mobility

Aleatica, in partnership with leading international industrial companies, universities and public institutions have developed the pilot program “Arena del Futuro” to drive sustainable mobility on a test track within the A35 BreBeMi motorway.

The project consists of an innovative Dynamic Wireless Power Transfer System (DWPT) and incorporates the placement of coils under the asphalt, that transfer energy directly to the electric vehicle. DWPT comes with a number of advantages over standard EV charging including:

- 1 A safer charging experience as a result of no electrical safety hazards above ground;
- 2 Greater efficiency and convenience for customers as they would no longer have to stop to charge their vehicle;

- 3 A reduction of the size of EV batteries given the system charge is in excess of typical consumption;
- 4 Avoidance of peak charging times and pricing as recharge would be happening throughout the day; and
- 5 A better overall quality of travel and customer experience.

The DWPT technology is achievable thanks to innovative 5G technologies and AI-based application solutions, which facilitate the exchange of information between the vehicle and management platforms.

In recognition of this program and innovative technology, Arena del Futuro won the award for best innovative project, presented during the Smart Transportation Alliance conference in 2022.

Airports – deep understanding of customers creates added value

Across our airport asset portfolios, we are seeing increasing traveller demand driven by:

- 1 Digitally savvy younger travellers that want efficiency, to blend work and leisure when travelling and expect world-class amenities, dining and retail options; and
- 2 Roving Baby Boomers who are looking for simplicity, support and seamlessness and are increasingly likely to travel in multi-generational groups.

We are seeing increased opportunities to improve even more tailored options to cater for a wide range of customer preferences through the customer journey.

Whether it is value or luxury, we seek to provide choices in terms of ground transport options, expanded dining choices, new shops and more

things to see and do while waiting for a flight.

Across our airports, we continue to advocate for a range of transit options, including public transport, ride share, taxi and private vehicle to get to and from the airport in a safe, efficient and reliable manner.

For travellers that choose to park at the airport, noting there is limited space available within walking distance to the airport terminals, we typically offer a range of choices for customers with various budgets.

As a recent addition at Melbourne Airport, in response to our car parking products' popularity, particularly during school holiday periods, the ground transport team introduced an attractive Value Express option³, which is very popular with families. For a modest one-time upgrade fee, the airport staff will park and retrieve your car when you return. Melbourne Airport has been pleased to have received very positive feedback from travellers who have opted for this enhanced product.

CASE STUDY 2



Assisting airport passengers with a disability

A rushed airport experience can be stressful for all types of travellers. For people with dementia, autism, anxiety and other disabilities not immediately obvious, airports can be especially challenging.

Our major capital airports have introduced a Hidden Disability Program to assist travellers requiring special assistance at airports. These passengers can request a sunflower lanyard at the airport and wear it discreetly at international and domestic terminals to alert airport staff that they might need additional care and consideration to get through the airport.

³ Melbourne Airport's new Value Express option

We are pleased to support Adelaide and Brisbane airports' investment into major terminal expansion projects that are currently underway. These transformative projects will significantly enhance the arrival and departure experience for passengers, increase the capacity of baggage systems and provide improved retail and dining options for travellers.⁴

Similarly, Manchester Airports Group's (MAG)⁵ £1.3bn Airport Transformation project is approaching completion. This project will revolutionise the customer experience from check-in to baggage reclaim, expand its Terminal 2 footprint and improve customer services with new shops, restaurants and state-of-the-art facilities. Not only has the project received strong passenger feedback, but the impact on the community has been positive as MAG and its engineering, procurement and construction partner have integrated the local supply chain into the project, sourcing 70% of jobs locally. In total, it is expected that more than 16,000 jobs will be generated by 2040 from this work, with MAG's economic contribution to the Northern UK economy expected to increase by nearly 80% over that timeframe.

Finally, we strive to ensure our assets are inclusive and cater to people from all different backgrounds, abilities, and cultures. We seek to ensure people with a disability are well served through staff training, improved access and facilities (Case Study 2) and continue to ensure people from different cultures can make their way through airports from arrival to gate through ever improving wayfinding technologies. Ultimately, we believe that investing in customer experience is a critical lever in enhancing returns to our investors over the long term.



⁴ For more information see: [Biggest transformation in Brisbane Airport history](#) and [Adelaide Airport retail news](#)

⁵ IFM Investors owned 35.5 per cent of Manchester Airport Group at 30 June 2023. For more information see: [Manchester Airport: Your new Terminal 2](#)

Important Disclosures

The following disclosure applies to this material and any information provided regarding the information contained in this material. By accepting this material, you agree to be bound by the following terms and conditions. The material does not constitute an offer, invitation, solicitation, or recommendation in relation to the subscription, purchase, or sale of securities in any jurisdiction and neither this material nor anything in it will form the basis of any contract or commitment. IFM Investors (defined as IFM Investors Pty Ltd and its affiliates) will have no liability, contingent or otherwise, to any user of this material or to third parties, or any responsibility whatsoever, for the correctness, quality, accuracy, timeliness, pricing, reliability, performance, or completeness of the information in this material. In no event will IFM Investors be liable for any special, indirect, incidental, or consequential damages which may be incurred or experienced on account of a reader using or relying on the information in this material even if it has been advised of the possibility of such damages.

Certain statements in this material may constitute "forward looking statements" or "forecasts". Words such as "expects," "anticipates," "plans," "believes," "scheduled," "estimates" and variations of these words and similar expressions are intended to identify forward-looking statements, which include but are not limited to projections of earnings, performance, and cash flows. These statements involve subjective judgement and analysis and reflect IFM Investors' expectations and are subject to significant uncertainties, risks, and contingencies outside the control of IFM Investors which may cause actual results to vary materially from those expressed or implied by these forward-looking statements. All forward-looking statements speak only as of the date of this material or, in the case of any document incorporated by reference, the date of that document. All subsequent written and oral forward-looking statements attributable to IFM Investors or any person acting on its behalf are qualified by the cautionary statements in this section. Readers are cautioned not to rely on such forward-looking statements. The achievement of any or all goals of any investment that may be described in this material is not guaranteed.

Past performance does not guarantee future results. The value of investments and the income derived from investments will fluctuate and can go down as well as up. A loss of principal may occur.

This material may contain information provided by third parties for general reference or interest. While such third-party sources are believed to be reliable, IFM Investors does not assume any responsibility for the accuracy or completeness of such information.

This material does not constitute investment, legal, accounting, regulatory, taxation or other advice and it does not consider your investment objectives or legal, accounting, regulatory, taxation or financial situation or particular needs. You are solely responsible for forming your own opinions and conclusions on such matters and for making your own independent assessment of the information in this material. Tax treatment depends on your individual circumstances and may be subject to change in the future.

Environmental, Social, and Governance ("ESG") strategies may take risks or eliminate exposures found in other strategies or broad market benchmarks that may cause performance to diverge from the performance of these other strategies or market benchmarks. ESG strategies will be subject to the risks associated with their underlying investments' asset classes. Further, the demand within certain markets or sectors that an ESG strategy targets may not develop as forecasted or may develop more slowly than anticipated. Sustainability- and ESG-related practices differ by region, industry, and issue and are evolving accordingly. As such, an investment's sustainability/ESG performance and practices, or IFM Investors' assessment of such performance or practices, may change over time. Similarly, new and evolving sustainability requirements imposed by jurisdictions in which IFM Investors does business and/or in which its funds are marketed may result in additional compliance costs, disclosure obligations, or other implications or restrictions on IFM Investors. Under such requirements, IFM Investors may be required to classify itself, its funds, or an individual investment therein against certain criteria, which may be open to subjective interpretation. IFM Investors' view on the appropriate classification may develop over time, including in response to statutory or regulatory guidance or changes in industry practices or approaches to classification. A change to the relevant classification may require further actions to be taken, such as requiring further disclosures by the relevant fund or new process to be set up to capture data about the relevant fund or its investments, which may lead to additional costs. It should not be assumed that any investment will be profitable or avoid losses.

Investment on the basis of sustainability/ESG criteria involves qualitative and subjective analysis. There is no guarantee that the determinations made by an adviser will align with the beliefs or values of a particular investor, and we cannot guarantee that our ESG/sustainability policies will result in the performance or outcomes expected. For example, this document contains ESG-related statements based on hypothetical scenarios and assumptions as well as estimates that are

subject to a high level of inherent uncertainty. Certain statements may also be based on standards and metrics for measuring a company's ESG profile, as well as standards for the preparation of any underlying data for those metrics, that are still developing and internal controls and processes that continue to evolve. While these are based on expectations and assumptions believed to be reasonable at the time of preparation, they should not be considered guarantees. Relatedly, there is no guarantee that any investment or its operations will achieve its ESG targets or, whether or not such targets are met, have a positive ESG impact, either on particular ESG topics or as a whole. There are significant differences in interpretation of what constitutes positive ESG impact, and those interpretations are rapidly changing. We may be required to expend substantial effort or incur additional costs to address such matters, including but not limited to evolving legal obligations or due diligence. Additionally, adhering to an ESG policy may result in missed opportunities, which may be difficult to predict due to the subjective and longer-term nature of some of these issues.

An infrastructure investment is subject to certain risks including but not limited to: the burdens of ownership of infrastructure; local, national and international economic conditions; the supply and demand for services from and access to infrastructure; the financial condition of users and suppliers of infrastructure assets; changes in interest rates and the availability of funds which may render the purchase, sale or refinancing of infrastructure assets difficult or impractical; changes in environmental and planning laws and regulations, and other governmental rules; environmental claims arising in respect of infrastructure acquired with undisclosed or unknown environmental problems or as to which inadequate reserves have been established; changes in energy prices; changes in fiscal and monetary policies; negative economic developments that depress travel; uninsured casualties; force majeure acts, terrorist events, under insured or uninsurable losses; and other factors beyond reasonable control.

This material is provided for educational purposes only and should not be construed as investment advice or a recommendation to buy or sell securities.

US Disclosure

This material is for use with institutions only and not for use with retail investors. The material, if presented in the US, is offered by IFM (US) Securities, LLC, a member of FINRA and SIPC.

Australia Disclosure

This material is provided to you on the basis that you warrant that you are a "wholesale client" or a "sophisticated investor" or a "professional investor" (each as defined in the Corporations Act 2001 (Cth)) to whom a product disclosure statement is not required to be given under Chapter 6D or Part 7.9 of the Corporations Act 2001 (Cth). IFM Investors Pty Ltd, ABN 67 107 247 727, AFS Licence No. 284404, CRD No. 162754, SEC File No. 801-78649.

Netherlands Disclosure

This material is provided to you on the basis that you warrant that you are a Professional Investor (professionele belegger) within the meaning of Section 1:1 of the Dutch Financial Supervision Act (Wet op het financieel toezicht). This material is not intended for and should not be relied on by any other person. IFM Investors (Netherlands) B.V. shall have no liability, contingent or otherwise, to any user of this material or to third parties, or any responsibility whatsoever, for the correctness, quality, accuracy, timeliness, pricing, reliability, performance, or completeness of this material.

United Kingdom Disclosure

This material is provided to you on the basis that you warrant that you fall within one or more of the exemptions in the Financial Services and Markets Act 2000 ("FSMA") [(Financial Promotion) Order 2005] [(Promotion of Collective Investment Schemes)(Exemptions) Order 2001, or are a Professional Client for the purposes of FCA rules] and as a consequence the restrictions on communication of "financial promotions" under FSMA and FCA rules do not apply to a communication made to you. IFM Investors (UK) Ltd shall have no liability, contingent or otherwise, to any user of this material or to third parties, or any responsibility whatsoever, for the correctness, quality, accuracy, timeliness, pricing, reliability, performance, or completeness of the information in this material.

Switzerland Disclosure

This Information is provided to you on the basis that you warrant you are (i) a professional client or an institutional client pursuant to the Swiss Federal Financial Services Act of 15 June 2018 ("FinSA") and (ii) a qualified investor pursuant to the Swiss Federal Act on Collective Investment Schemes of 23 June 2006 ("CISA"), for each of (i) and (ii) excluding high-net-worth individuals or private investment structures established for such high-net worth individuals (without professional treasury operations) that have opted out of customer protection under the FinSA and that have elected to be treated as professional clients and qualified investors under the FinSA and the CISA, respectively.

IFM-13March2024-3434096