INFRASTRUCTURE

Uncertainty, transition and social factors

Infrastructure Outlook

April 2023

ifm investors

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Introduction

The macro environment is presenting a host of new challenges for infrastructure managers with the possibility of central bank over-tightening and the threat of recession looming hard.

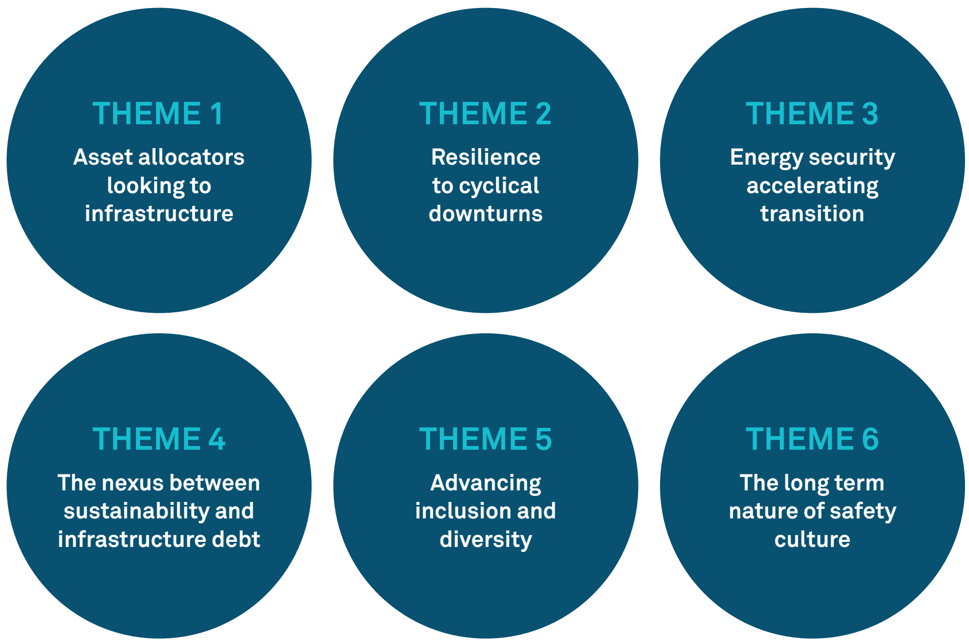
At the same time, the global focus on climate change has intensified in response to Russia's invasion of Ukraine and the increase in unseasonal weather patterns across the world. This has heightened global climate awareness and suggests the transition to net zero is set to accelerate as countries seek to integrate energy security into their transition pathways.

Sustainable investing is also evolving outside of climate, with the importance of managing the social factors (the "S") in ESG attracting increasing attention. Complete integration of ESG considerations depends on the 'S' being measured and managed as comprehensively as the 'E' and the 'G' and investors are starting to respond.

As one of the world's largest infrastructure investors, with portfolio assets spanning more than 20 countries, we are analysing these global trends very closely as they have the potential to impact our investment decision-making and the way in which we manage the assets owned by our portfolio companies.

We expect the resilience of infrastructure assets to be tested in 2023 but there are reasons to remain optimistic. This report covers six prominent themes that we believe will shape the infrastructure market in the year ahead.

THEMES FOR INFRASTRUCTURE INVESTORS Six areas to watch



Alex Joiner
Chief Economist

The economic backdrop

The key challenges we see for developed countries in the next 12 months include stubbornly high inflation, ongoing supply disruptions, tightening monetary policy, softening global growth and geopolitical uncertainty. This suggests financial markets will remain volatile.

Inflation may be near its peak, but there is evidence of broader-based price pressures emerging and there remains considerable uncertainty around how quickly inflation will moderate over the next few years.

Central banks are expected to implement further interest rate rises and have signalled a willingness to keep policy tight until inflation is firmly back under control. If inflation remains persistently above target, this aggressive policy action could sharply weaken global growth and increase the risk of a prolonged recession.

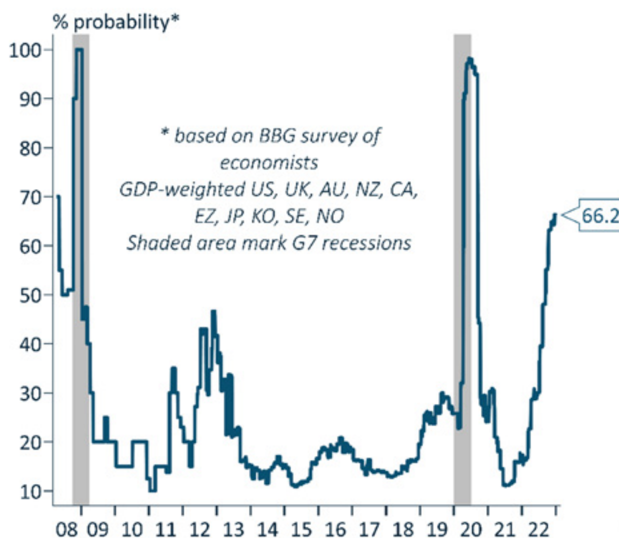
The labour market response to policy tightening is crucial to the outlook. Right now, labour demand remains robust and unemployment rates are very low, suggesting true 'stagflation' is unlikely. We know that some labour market softening is probably necessary to get inflation back to target, but how much of this adjustment will be achieved through lower excess labour demand and how much will occur via higher unemployment remain uncertain. The latter is more problematic as it impacts household income and demand.

Leading indicators currently suggest growth is slowing across advanced economies, with the UK and Eurozone likely to enter a recession in 2023. Consumers could be hard-hit, with sharply falling real disposable incomes due to cost-of-living pressures.

The US is in a relatively strong position and less likely to experience a recession. This partly because the US is relatively insulated from the energy price shocks stemming from the Russian invasion of Ukraine. But the US has its own issues with its banking sector under pressures from rapidly rising interest rates. Consequently recession risk is still sizeable. The US Federal Reserve has been particularly outspoken about its willingness to keep policy rates elevated until there are clear and unambiguous signs of disinflation, even if unemployment rises materially. Job vacancies remain elevated at present, suggesting continued strong demand, but the full impact of higher rates and a slowing economy remain to be seen.

Australia faces similar economic challenges to get inflation under control while keeping the economy expanding at a reasonable pace. A record terms of trade in 2022 has helped repair fiscal metrics and is acting as a tailwind to the economy. Population growth is also expected to rebound strongly and underpin economic activity. The Reserve Bank of Australia (RBA) continues to tighten monetary policy, which will likely slow the economy in 2023, but expectations of a recession are much less pronounced than in other advanced economies. This is largely due to terms of trade tailwinds and the RBA's decision to moving more gradually in its policy tightening, cognisant of the impact it will have on the domestic economy via the highly leveraged household sector.

FIGURE 1 ADVANCED ECONOMY RECESSION PROBABILITY



Source: IFM Investors, Bloomberg, IMF, Macrobond

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Luba Nikulina
Chief Strategy Officer

Infrastructure, an asset class for all seasons

The role of infrastructure in institutional portfolios will continue to be a prominent theme for asset allocators in 2023, along with the increasing engagement within the investment community on how to manage the 'S' – or social factors – within ESG.

by Luba Nikulina

INFRASTRUCTURE INSIGHT

The job of asset allocators is never easy, but the recent macro environment has been particularly challenging given correlated weakness in equity and bond markets. Increasing interest rates around the world and the impact they have had on valuations across most asset classes have proven difficult for 60:40 style investors and this has been reflected in negative returns.

To us, this again highlights the strategic importance of the infrastructure asset class for asset allocators, given its resilience through economic cycles and its effectiveness as an inflation hedge. We believe the infrastructure asset class has a role to play as a foundation portfolio asset class aimed at securing diversified, less volatile, low correlation long-term returns.

In addition to its defensive and diversifying characteristics, infrastructure also has a strong growth momentum behind it. A few meaningful macro trends are contributing, such as ageing and underinvested infrastructure in the developed world and the requirement for a significant ramp-up in emerging markets infrastructure. And most importantly, the urgent need to decarbonise the global economy, but in a prudent way that allows countries to preserve their energy security. This requires enormous investments in the traditional and emerging infrastructure ecosystem around the world.

In addition to these environmental demands, the integration of social factors (which are the 'S' in ESG) in infrastructure investments is also going to be topical in 2023. It is a theme that is attracting increasing attention because complete integration of ESG considerations depends on the 'S' being measured and managed as comprehensively as the 'E' and the 'G'.

A challenging macro environment for asset allocators

Looking back, the investment environment in the decade leading up to the pandemic was relatively favourable given strong global growth, widespread disinflationary pressures, generous monetary stimulus from central banks through low interest rates and quantitative easing, and

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governments providing further fiscal stimulus in response to pandemic-induced lockdowns. Asset allocators could stay invested in equities for growth and use bonds and derivatives for protection. Relatively high valuations in listed markets also prompted significant growth in private markets as investors sought to sustain performance with the added benefit of increased diversification.

But in 2022, everything changed. Inflation that was initially deemed transitory suddenly became persistent and pervasive. Post-pandemic supply chain disruptions, prolonged lockdowns in China and the massive energy, commodity and food price shocks caused by Russia's invasion of Ukraine combined to force central banks into a very aggressive monetary policy tightening cycle that is not yet over. The rising tide of global liquidity that 'floated all boats' is in the process of receding rapidly.

The combination of accelerating inflation, rising interest rates, and slowing economic activity has been very challenging for asset allocators for several reasons:

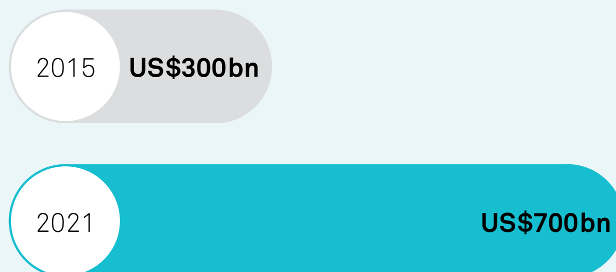
- Bonds are traditionally viewed as defensive assets, but yields have risen sharply, causing significant falls in value. These value moves in US and UK government bonds were modelled as a less than once-in-100-years event. Real returns (inflation adjusted) in bond markets were still negative at the time of writing, although asset allocators are increasingly seeing value in some segments of the credit markets in expectation of the resurgence of yield generating fixed income and credit strategies.
- Equity markets have also been weak, but this adjustment was mostly a reflection of the rise in the discount rate in 2022, and it is only in the most recent earnings cycle that negative growth expectations have started coming through. The only certainty about the equity markets in 2023 is continued volatility and uncertainty.
- Current market pricing suggests that investors expect inflation to come under control in 2023 and that this will be achieved with only a small slowdown in GDP and a quick return of earnings growth. Whilst this would be a welcome outcome, it would be historically unprecedented, and economists are currently more pessimistic, with Bloomberg survey data suggesting the probability of a global recession is currently around 66%[1]. Instability in the global banking sector only adds to the list of economic risks going forward. Taming the level of inflation that is currently evident in the US and Europe without some material economic cost is, in our view, unlikely.

This has been a "nowhere to hide" environment for asset allocators. The weakness in asset values has also increased the importance of searching for resilience, inflation linkage but also true alpha in alternative markets.

The opportunity in infrastructure

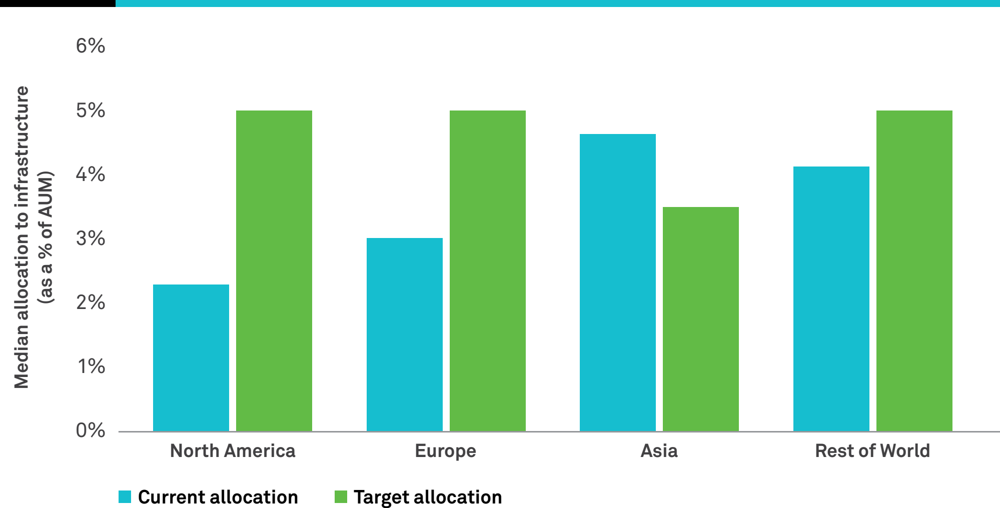
From an asset allocator's perspective, interest in the infrastructure asset class has grown significantly in recent years

Allocations to externally managed infrastructure by institutional investors have grown from around US$300bn to over US$700bn over the six years to 2021.[2]



[1] Based on Bloomberg's survey of economists, GDP-weighted US, UK, AU. NZ, CA, EZ, JP, KO, SE, NO
[2] McKinsey's Global Growth Cube database

FIGURE 1 INVESTORS' MEDIAN CURRENT AND TARGET ALLOCATION TO INFRASTRUCTURE BY LOCATION



Source: Preqin Global Report 2023: Infrastructure. Survey data as at November 2022.

as investors have sought private market investments to generate attractive returns given relatively high listed market valuations.

In the current challenging market environment, we expect this growth trend to continue for several reasons:

- The resilience of infrastructure to macro swings – Contracted pricing links to inflation and inelastic demand for their services make many infrastructure assets quite resilient to economic downturns. This is discussed in detail in an article later in this Report titled *Infrastructure remains resilient despite macro challenges*, and it suggests that infrastructure could continue to outperform other assets classes in 2023, providing potentially attractive returns.
- Investors generally remain underweight – Our research suggests that pension funds and other institutional investors, in aggregate, remain underweight the infrastructure asset class relative to their long-term targets. This is supported by data from Preqin as detailed in Figure 1. While the current discrepancy between public and private valuations has led many investors to be over-allocated to private markets, it is clearly a temporary phenomenon. Once valuations adjust closer to their fundamental values, we believe infrastructure has plenty of potential for additional allocations, particularly given its expected resilience to cyclical downturns. Many institutional investors still do not have a separate allocation to infrastructure, so there is also the potential for new allocations to the sector as private markets continue to expand in future. We believe that over time, infrastructure will become as ubiquitous as commercial property in a truly well-diversified asset allocator's portfolio. We also believe there is an opportunity for global investors to build allocations to private markets, to the extent that their liquidity allows, as the foundation assets of portfolios long-term.

The growing importance of the 'E' plus 'S' in infrastructure

Over the last decade, the importance of the 'E' (environmental factors within ESG) in infrastructure investing has become virtually indisputable for asset allocators. Climate change has come to the fore and should be considered as both a risk and an opportunity. In fact, we believe it is a significant opportunity for infrastructure investors.

Another more recent broad trend which is significant for both asset allocators and infrastructure is the increasing engagement within the investment community on how to manage the 'S' – or social factors – within ESG. As with the 'E' and the 'G', there is a growing awareness that social factors and social system settings carry investment risks and opportunities for companies and investors.

Social factors that are particularly relevant to infrastructure investors, include:

- Organisational workforce practices, especially labour rights and health and safety

- Supply chains and modern slavery
- Inequality across income, wealth, and opportunity
- Inclusion and diversity.

Social factors can impact companies' reputations and financial performance, and this is why we believe the consideration of social factors is intrinsic to the fulfilment of fiduciary obligations in the investment context.

The advantage of unlisted infrastructure is that it sits in the private markets sphere where investors like IFM can have the most direct influence on social factors, as they own or part-own the infrastructure assets in their portfolios. This provides a level of influence over corporate strategy that is usually much higher than in listed markets.

At IFM we have an active program to integrate consideration of the 'S' factors across our listed and unlisted asset portfolios and our commitment to consider social factors is anchored in deep social dialogue, in line with OECD guidelines. IFM's views on two major social themes – health & safety and inclusion & diversity - are discussed in more detail in separate articles that feature later in this report – *The constant quest for greater safety across infrastructure assets and I&D maturity and infrastructure assets*.

As institutional investors become more sophisticated in understanding the risks and opportunities associated with social factors, it is likely that there will also be a growing need for more precise measurement of the impact these factors can have on investments and portfolios. One of the biggest challenges that investors face is the lack of common metrics and reliable data with which to measure social factors and impacts. The UK's recently announced Taskforce on Social Factors established by the Department for Work and Pensions is an attempt to improve this lack of data availability and we expect more action on this globally in the year ahead.

By working as a collective, with a view to maximising long-term returns for members, we believe institutional investors have an opportunity to develop a range of meaningful metrics which will help all investors to better identify the risks and opportunities associated with social factors. This would also support an industry-wide prioritisation and management of the systemic challenges that are so material to long-term investment performance.

One of the biggest challenges that investors face is the lack of common metrics and reliable data with which to measure social factors and impacts.

An asset class for all seasons

The year ahead is likely to pose a host of new challenges for asset allocators as markets navigate tight monetary policy and the possibility of a global recession looms. But asset allocators are increasingly recognising the important role that Infrastructure can play in institutional portfolios given its historical track record of relatively stable long-term returns and resilience to cyclical downturns[3]. We expect this to continue to be a key theme in 2023 given increasing infrastructure investment opportunities arising from the transition to net zero and underweight investors seeking to increase their infrastructure exposure.

There is also a growing recognition that managing social factors is part of an investor's fiduciary duty given the potential risks they pose to reputation and financial returns. We expect this to gain momentum within infrastructure markets given the direct influence that institutional asset managers can have over the corporate strategy employed at portfolio companies.

[3] Past performance does not guarantee future returns.

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Michael Landman,
Executive Director
Infrastructure

Infrastructure remains resilient despite macro challenges

Tightening monetary policy, rising interest rates, the Russian invasion of Ukraine and a limited banking crisis have shifted the macro landscape to the point where a global recession is increasingly likely in 2023. Whilst the infrastructure asset class is not immune to these challenges, we expect it to remain resilient given favourable links to inflation and steady underlying demand.

by Michael Landman, Executive Director Infrastructure

Macro challenges abound

After years of expansionary monetary policy, central banks are currently walking a tightrope, fighting inflation with rapid rate rises, whilst trying to deliver a soft landing for the global economy and preventing a full-blown banking crisis.

Mortgage interest rates have more than doubled in the past year in the US and UK, and European households are facing the further challenge of sharply higher utility bills as supplies of energy are curtailed.

These global challenges are problematic for investors as the combination of slowing growth, high inflation and tightening monetary policy has resulted in significant weakness across listed equities and fixed income markets in the latter part of 2022. The high correlation between listed equities and fixed income has severely reduced diversification benefits in mixed asset class portfolios. In this challenging macro environment, we think that there are good reasons to believe that unlisted infrastructure will continue to perform relatively well.

Inflation and infrastructure – the natural hedge

The return of inflation and the associated sharp rise in interest rates have been dominant global themes in 2022[1]. We expect them to remain a key focus in 2023, along with the integrity of the banking system and continued geopolitical tensions.

To recap, higher interest rates have traditionally been viewed as a negative for the performance of long-duration investments like infrastructure, as they put downward pressure on asset valuations. This is directly due to the potential increase in the cost of borrowed capital, and indirectly because the discount rate used to value cash flows is likely to increase in response to

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[1] Infrastructure – rising rates and the "natural hedge" (ifminvestors.com)

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changes in the risk-free rate (which is linked to long-term sovereign bond rates).

What we find in practice, however, is that the valuations within a well-constructed Infrastructure portfolio tend to be positively impacted by the root cause of higher rates – namely inflation. Infrastructure assets are often positively linked to inflation through contracted increases in prices for services that are linked to CPI. Such arrangements are common amongst regulated utilities, toll roads and ports, and they normally mean that the negative impacts from higher rates are at least partially offset by the positive influence of inflation on revenues.

There are two important points to note regarding the pressures brought by rising rates. Firstly, infrastructure managers should have been capitalising on the recent long period of relatively low rates, so the impact of increased rates will be gradual as laddered long-term debt is refinanced. Secondly, with respect to discount rates, independent valuation firms used by asset managers tend to take a long-term view when setting the risk-free rate, taking into account historical long-term sovereign bond rates and sustained changes in those rates. These factors are evident in both listed and unlisted markets, where infrastructure valuations tend to be less volatile than the broader equities market in response to negative macro events.

What if the global economy enters recession?

Revenue for most infrastructure assets is of course a combination of price times volume. As populations and economies grow, and the use of essential services increases, this can have positive flow-on impacts to revenues. Therefore, both price inflation and economic growth can provide infrastructure assets with a natural hedge that may offset any adverse impacts from rising rates.

The other side of this dynamic presents a key risk for 2023, namely the possibility that central bank monetary policy tightening proves too aggressive and global economic activity pushes into recession territory. But even in this scenario, we think that an investment in a mature well-diversified infrastructure portfolio would generally outperform broader equities investments, and potentially most other asset classes.

We have this conviction because infrastructure businesses generally operate real assets that provide essential services to the communities they serve. Underlying demand for these services tends not to be subject to the same level of competitive forces that exist in many other industries. Although a period of weak economic growth, particularly accompanied by a rapid deceleration of inflation, could result in more subdued performance of assets within GDP-linked transportation sub-sectors, exposure to a balanced portfolio which includes diversified utilities and contracted services should mitigate the effect of cyclical performance.

Interestingly, this view seems to be well-supported by the recent performance of *listed* infrastructure assets. It is well known that listed investments can be more volatile as they are subject to broader swings in market sentiment than unlisted infrastructure, where best practice is to have investments valued quarterly by professional independent valuation firms, under various well-recognised accounting and valuation standards.

Nevertheless, despite the choppy market conditions in 2022, the S&P Global Listed Infrastructure Index (USD Hedged Net Total Return) was up 3.8% over the 12 months to 31 December 2022, while the broader MSCI World Equities Index (USD Hedged Net Total Return) performance was significantly weaker at -15.4%. Further, although Infrastructure is often classified as being a mix of "defensive" and "growth" investment styles, listed infrastructure significantly outperformed both Value and Growth stocks in 2022 as shown in Figure 1. We believe this demonstrates that even listed asset markets are recognising the resilience of the infrastructure asset class in the current volatile, rising rates and inflationary macro environment.[2]

Both price inflation and economic growth can provide infrastructure assets with a natural hedge that may offset any adverse impacts from rising rates.

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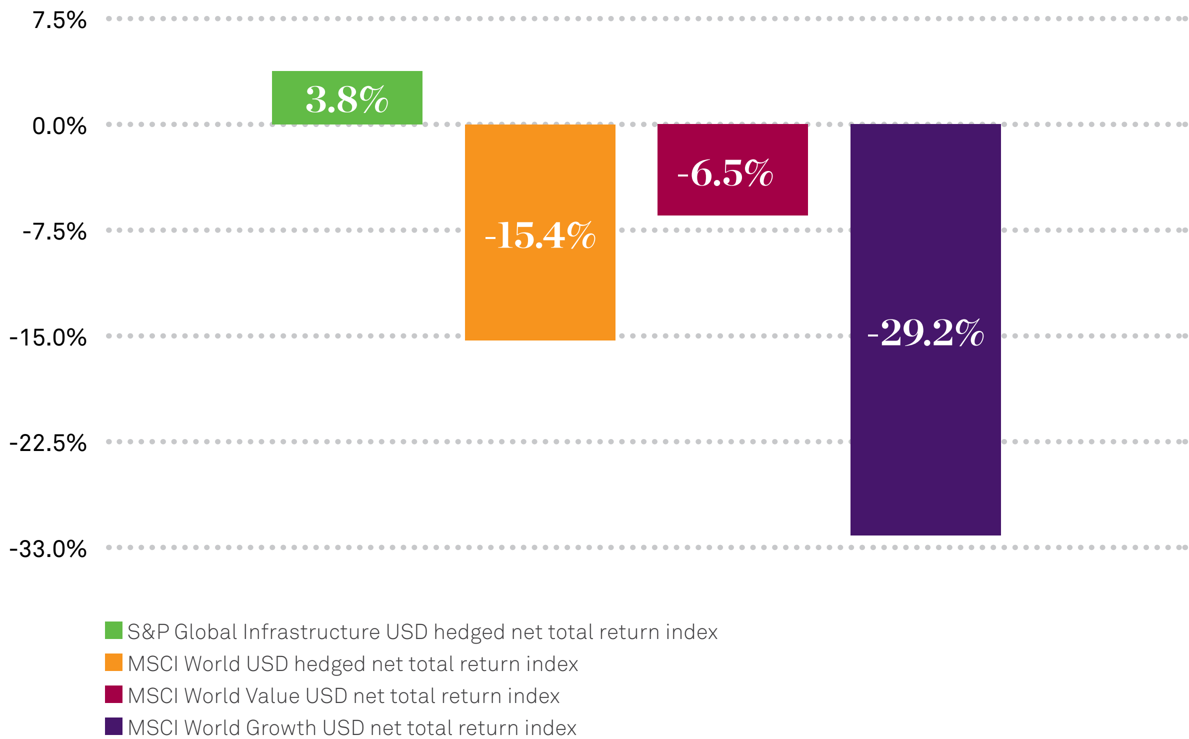
Diversification cannot ensure a profit or protect against loss in a declining market. It is a strategy used to help mitigate risk.

[2] Although markets remained volatile at the beginning of 2023 led by a recovery in growth stocks, the relative performance for the period 1 Jan 2022 - 21 March 2023 remains similar to that in Figure 1, with the S&P infrastructure index significantly outperforming the other listed indices.

FIGURE 1 LISTED MARKET RETURNS – CY2022



Source: Bloomberg

PORTFOLIO EXAMPLE

Indiana Toll Road's links to inflation and growth

IFM infrastructure portfolio company, Indiana Toll Road (ITR), is a good example of how infrastructure assets often have built-in resilience to economic conditions:

- ITR benefits from rising economic activity through increases in its traffic volumes, which remained particularly robust during the COVID period due to the strong demand for goods transported by heavy vehicles, offsetting the reduced car traffic experienced at the time.
- ITR has inflation protection embedded in its toll escalation mechanism, which allows for annual average toll increases at the greater of CPI, nominal GDP per capita or 2% (which provides a floor on price escalation).
- Negative inflationary impacts on ITR's operating cost base benefit from the three-pronged revenue protection mechanism above.

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IFM Insights - Infrastructure resilience across sectors

Infrastructure assets are showing significant resilience to the current macro volatility as illustrated by the following insights we have gleaned from some of our portfolio companies.

Toll Roads

The resilience of the movement of freight has been remarkable, both locally and globally. While COVID triggered supply chain disruptions, and higher logistic and input costs have been negative influences, trade has generally held up well. This has broadly supported transportation sector assets, including many in our infrastructure portfolios.

For example, most of our toll roads have experienced record truck movements, exceeding pre-COVID levels, since March 2021 (as highlighted in the previous ITR example). This is significant as trucks pay higher tolls than cars due to their increased footprint on the road and their greater impact on wear and tear of the road surface. In addition, tolling concession pricing is frequently linked to CPI.

Seaports

Similarly, seaports have also remained resilient, with the movement of goods underpinned by the general strength in consumer demand. All IFM's seaports remained operational throughout the pandemic period, reflecting the critical role these assets play in local and global economies. While the impact of the Russia-Ukraine conflict (particularly at European ports) and steeply higher shipping costs have been negative impacts on performance, we have observed a strong recovery in volumes, with 2022 volumes trending above pre-COVID levels.

Though existing supply chain congestion continues, additional planned fleet capacity and the continued reopening of Chinese trade is expected to support a positive global trade outlook. Whilst volumes may come under pressure if there is a global economic slowdown, an offsetting factor is port tariff regimes that are often linked to inflation.

Airports

Airports globally experienced significant disruption from early 2020 due to the pandemic. But in 2022, there has been a widespread return of people to short and long-haul travel, even though ticket prices are materially higher. Airports are generally experiencing demand levels similar to pre-pandemic era and this is largely being driven by leisure travel. Our airports show passenger numbers tracking at approximately 80- 90% of pre-pandemic levels towards the end of 2022.

Interestingly, this recovery has really been held back by supply constraints, not a lack of demand. Airlines are generally running with higher load factors (meaning that their planes are largely full) whilst charging relatively high prices for tickets. If this continues, the next 12 months could be a profitable period for the airlines, enabling them to strengthen their balance sheets and potentially expand capacity.

Utilities

Utilities are normally classified as 'defensive' investments for good reason. These assets are typically backed by inflation-linked revenue mechanisms and an element of downside protection to rising rates due to the positive linkage between the regulatory cost of capital and the market cost of debt. This is reflected in our global portfolio, where regulated capital values and returns at Anglian Water are set in real terms by the regulator and Enwave Energy's revenues are supported by long-term CPI-linked contracts with customers.

The resilience of these assets was displayed at the onset of the COVID pandemic, when there were concerns relating to potential customer defaults and bill collections. Issues with revenue collection were found to be quite limited, aided by pre-emptive measures such as tracking payment behaviours and monitoring customer stress. More recently in Europe, there has been a significant increase in utility bills due to the Russia-Ukraine conflict, disruption to gas supplies and recent moves by OPEC to cut production of crude oil. Measures and policies by most European governments are in place to curb the impact of rising energy prices on households and businesses. So far, our assets have experienced limited exposure to direct energy markets or geographies impacted by the underlying geopolitical tension.

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Nicole Zhang
Vice President

Nicholas Rivera
Associate

Advancing inclusion and diversity in infrastructure

As part of the growing awareness that social factors present risks and opportunities for companies and investors, infrastructure managers cannot ignore the potential benefits of embedding I&D considerations in asset management activities.

by Nicole Zhang & Nicholas Rivera

INFRASTRUCTURE INSIGHT

The body of research evidencing I&D as a powerful driver of business growth and performance continues to grow.[1] I&D has been increasing in prominence as a sustainable investment theme in major public markets globally for over a decade[2], and private market investors are increasingly following suit.[3]

Constrained labour market conditions in major economies around the world mean businesses are facing an ever-growing challenge of recruiting and retaining staff. Beyond these challenges, global sustainability issues, like income inequality and climate change impacts on communities and workers, present challenges that require innovative solutions.

Infrastructure managers and their portfolio companies are not immune to the business risks that this challenging environment creates. We see potential benefits for a sharper focus on I&D and opportunities for managers to work closely with portfolio company boards and management teams to mature I&D strategies.

I&D as a driver of business performance and long-term resilience

The incorporation of I&D considerations in business and investment activities is recognised as both a risk mitigant and a value driver.[1]

Applying an I&D lens to core business activities like recruitment and retention can support access to an expanded talent pool and help to attract and retain people with diverse skills, perspectives and ideas, leading to new ways of thinking in an organisation. This diversity of thought supports more innovative thinking and better decision-making, which correlates with more competitive business performance.[1]

By nature, core infrastructure assets,

[1] McKinsey & Company May 2020 Diversity wins: How inclusion matters. Accessed 10 Dec. 2022 https://www.mckinsey.com/featured-insights/diversity-and-inclusion/diversity-wins-how-inclusion-matters
[2] 30% Club has grown to become a network of more than 1,000 board chairs and CEOs of some of the world's biggest public companies since 2010 as per website accessed 11 Dec. 2022 https://30percentclub.org/what-is-the-30-club/
[3] EY Dec 2021 Can PE win deals if it doesn't deal with DE&I? Accessed 10 Dec. 2022 https://www.ey.com/en_eg/private-equity/can-pe-win-deals-if-it-doesn-t-deal-with-dei; New Private Markets DEI in private markets,: the state of play. Accessed 10 Dec . 2022 (subscription wall) https://www.newprivatemarkets.com/dei-in-private-markets-the-state-of-play/

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Supporting the local economy and minority-owned businesses

The Indiana Toll Road in the US relies on local vendors and suppliers for materials and equipment used to operate and maintain the roadway. It sees its work with local businesses as a way to invest in local jobs and strengthen surrounding communities. The toll road allocates a portion of its budget to working with local enterprises certified by the state as Minority-, Women-, Veteran-, and/or Disabled-owned businesses – known as XBEs - with the aim of strengthening its impact and establishing a wider expectation of inclusivity in communities; nearly US$7.0m was allocated in 2022.

Indiana Toll Road

such as toll roads, airports and utilities, provide essential services that underpin the smooth running of communities and economies. These assets can have a symbiotic relationship with the communities they serve. For example, employees and contractors are often hired within local communities. We see opportunities to embed I&D considerations in the management of external relationships, such as those with suppliers and other community stakeholders, to help create commercial benefits, strengthen reputation and social licence, and contribute to local community resilience.

A fundamental starting point for cultivating diversity of thought is to consider whether workforce demographics, particularly at executive and board levels, represent the community in which an asset operates and or serves. Achieving this can help ensure that stakeholder needs and wants are represented at the decision-making table. I&D strategies, therefore, often focus on gender, race and ethnicity, but can also consider variables such as socio-economic status, ability, neurodiversity and sexual orientation, among others. For some companies, it is relevant and important to consider the intersectionality of these variables; for example, women of colour and women with a disability, who face compounded challenges.[4]

Increasing female representation on boards

Managers can demonstrate a commitment to I&D at the highest levels of an organisation by making a conscious effort to improve female board representation in portfolio companies. An example of this is an IFM-driven step change improvement in female representation across the boards of our global and Australian infrastructure portfolio companies from 19% in 2017 to 28% in 2022, driven largely by IFM increasing the female representation of its asset board nominees from 18% to 28% in the same period.

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[4] LeanIn.Org and McKinsey &Company, 2022, Women in the Workplace. Accessed 10 Dec. 2022 from https://leanin.org/women-in-the-workplace/2022

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Fostering inclusion among employees and customers

Anglian Water

UK-based water management company Anglian Water offers employees the option to swap Christian religious bank holidays for a religious festival from their faith. The company launched training to help road and footpaths-works staff to understand mobility challenges of sight-impaired people. It also funded British Sign Language training for 40 employees to support communication with deaf and hard of hearing customers. The Indiana Toll Road has rolled out similar American Sign Language training for customer-facing employees to support a better and safer service for its deaf and hard of hearing toll road customers.

The power of diversity in workplaces and communities is enabled by cultivating inclusive workplaces and communities. This requires strategies, policies and practices that foster belonging and connectiveness for employees and community members who use or are impacted by an asset.

I&D maturity in infrastructure: the data versus insights

While it is difficult to assess the maturity of I&D across the infrastructure asset class, consideration of gender representation is one way to start building a macro picture. Women are underrepresented in key infrastructure sectors such as oil and gas; water utilities and construction.[5] This can be largely attributed to common occupations in the sector, such as engineering, for example, which is traditionally male-dominated, and remains so.[6]

We believe I&D maturity is best assessed across a range of organisational and demographic indicators at board, executive and whole-of-organisation levels.

We believe I&D maturity is best assessed across a range of organisational and demographic indicators at board, executive and whole-of-organisation levels. Due to the distinct characteristics of each asset, including location, sector, number of sites and staff and staff demographics, this is best done on an asset-by-asset basis.

For managers, a portfolio-wide approach with an asset-specific focus can help advance I&D maturity. The starting point is collecting data that can inform the development of asset-specific I&D plans that are regionally and culturally relevant and aim to advance I&D maturity from their current level.

The availability of existing useful data varies across companies. Privately held companies have historically not been subject to the same expectations of sustainability or ESG disclosure as public companies. Further, smaller operating companies, for example, may not have dedicated resources or processes to collect and track demographic and other data about its workforce; however, steps to improve organisational understanding are key to helping ensure that future I&D improvements are data-driven and supported by organisational insights that enrich decision making action.

5 World Petroleum Council and Boston Consulting Group, Dec 2021, Untapped reserves 2.0 Driving Gender Balance in Oil and Gas. Accessed 10 Dec. 2022 from https://www.bcg.com/publications/2021/gender-diversity-in-oil-gas-industry; Infrastructure Australia, Oct. 2021, Infrastructure Market Capacity. Accessed 10 Dec 2022 from https://www.infrastructureaustralia.gov.au/sites/default/files/2022-02/Infrastructure%20Market%20Capacity%20report%2020220201.pdf World Bank. 2019. Women in Water Utilities: Breaking Barriers. World Bank, Washington, DC. Accessed 10 Dec. 2022 from https://openknowledge.worldbank.org/bitstream/handle/10986/32319/140993.pdf?sequence=9

6 World Economic Forum, Insight Report, Global Gender Gap Report 2020 Accessed 16 Dec 2022 from https://www3.weforum.org/docs/WEF_GGGR_2020.pdf

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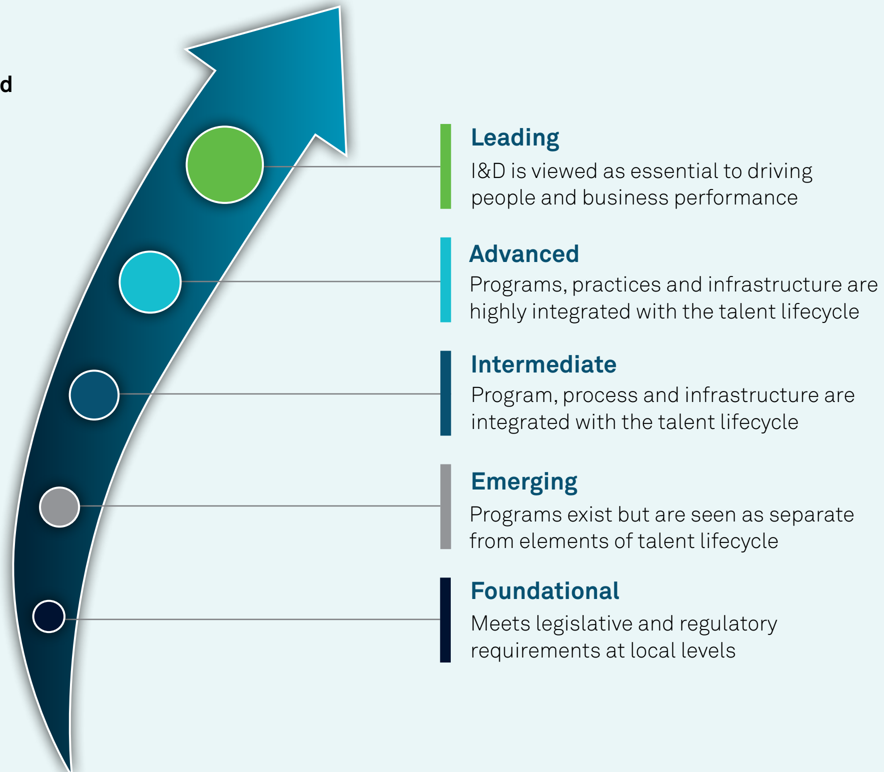
FIGURE 1 I&D MATURITY CURVE

Key considerations in an I&D maturity assessment rubric include strategy and policy, reporting, external relationships, employee engagement, leadership accountability and accreditation or external recognition.



Source: IFM Investors

Recommended focus areas for improved I&D in infrastructure

- **Invest in diversified talent pools** to help gain access to a broad range of talent, help ease labour constraints, and enable I&D permeation throughout the entire organisation as talent matriculates into more senior roles.
- **Develop policies and programs that support inclusion,** particularly those focusing on mental health and wellbeing, to help attract, retain, develop and support a diverse workforce, supported by senior leadership and the board of directors.
- **Measure employee satisfaction and engagement** to help monitor the success of I&D programs and strategies.
- **Expand I&D focus to external stakeholders** with the aim of contributing to customer access and social and economic resilience of the local community in which an asset operates and or serves.

Actively embracing I&D in decisions can contribute to the health of the broader social and economic systems in which infrastructure assets operate.

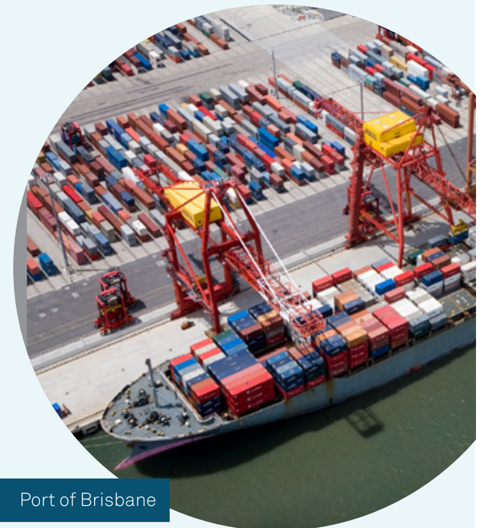
As part of the growing awareness that social factors present risks and opportunities for companies and investors, infrastructure managers cannot ignore the potential benefits of embedding I&D considerations in asset management activities, as this article has outlined. Beyond supporting better business and investment performance, actively embracing I&D in decisions can also contribute to the health of the broader social and economic systems in which infrastructure assets operate and depend upon to prosper now and in the future.

Developing diverse talent pipelines

Applying an I&D lens to developing talent pipelines can help relieve labour constraint challenges, build a more diverse workforce and boost the economic participation of underrepresented or marginalised groups in the community, as demonstrated by the following portfolio company examples:

- **Manchester Airport Group** in the UK established the Manchester Airport Academy in partnership with Trafford College. The Academy aims to help unemployed local residents of 16-plus years of age to gain skills and employment at the airport.
- **Airport Development Group (ADG)** in Australia is supporting education and career pathways through its Indigenous Training Academy in Darwin. The academy delivers nationally-recognised qualifications in hospitality and tourism, offering pathways for employment with ADG and its partners within the airport's precinct.
- In 2018, Australia's **Port of Brisbane** launched a cadetship program to promote women's participation in its Marine Operations business unit. The paid training program provided cadets with 'sea time' required to gain qualifications and offered working hours compatible with non-work commitments. The program has helped to challenge perceptions of careers for women in the maritime industry. Female representation in the unit has increased from 1.9% to 10.9% in the four years to December 2022.

Manchester Airport Group



Port of Brisbane

Investing in retention yields positive outcomes

In 2018, Conmex (one of Aleatica's Mexican business units) undertook a deep dive into its relatively high turnover rate of female toll collectors. Key concerns included working hours misaligned with school hours - an obstacle for women juggling a primary caregiver role - as well as unsuitable washroom facilities.

The company responded with allowances for flexible work arrangements and upgraded washrooms. Toll booths were also subject to an ergonomic upgrade.

As a result of these improvements and more conscious recruiting practices, female representation across the toll collector workforce increased from 7% in 2014 to 63% in 2022.. The company noted a correlation between increased female representation and efficiency and customer service improvements across the toll collection operational area.

David Cooper
Head of EMEA and Australian Infrastructure Debt

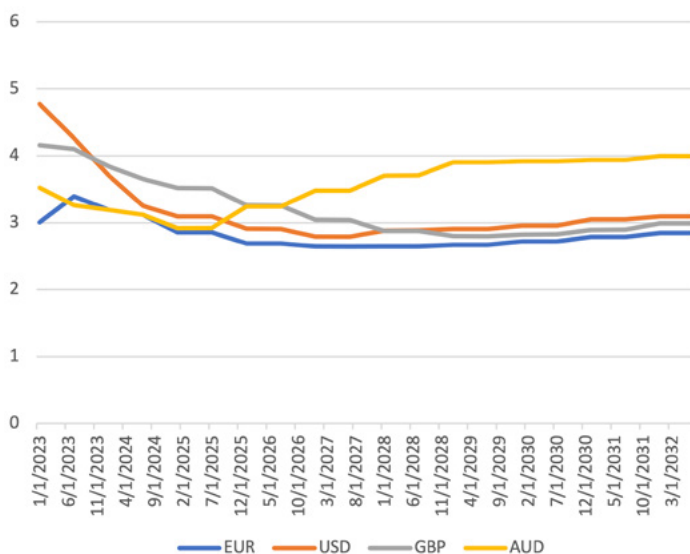
Jacob Otto
Director, Debt Product Specialist

Secular tailwinds are creating opportunities in infrastructure debt

The investing landscape across all asset classes is likely to remain challenging over the coming months, given high inflation, higher interest rates and the possibility of recession and continued market volatility. However, we believe infrastructure debt's built-in resilience to cyclical slowdowns will be a key theme over the next year, with two secular tailwinds continuing to drive deal activity in the market – the strength of government infrastructure investment and the enormity of investment required to fund the energy transition to decarbonise the global economy.

by David Cooper and Jacob Otto

FIGURE 1 6-MONTH INTEREST RATE EXPECTATIONS OVER NEXT 10 YEARS (%)



Source: Bloomberg, based on implied 6-month forward rates with maturities over the next 10 years. As of 17 March 2023.

Setting the macro scene

In response to the sharp rise in global inflation, central banks have been aggressively tightening monetary policy. Recent banking turmoil and potential spill-over effects into the broader economy means the interest rate outlook is mixed. Current market pricing suggests interest rates will remain elevated for some time as central banks continue to fight inflationary forces (Figure 1).

A global recession remains a significant risk if central banks tighten too much. Consumers are already having their real incomes eroded by inflation, dealing with the spike in energy prices, higher food prices and potentially higher mortgage payments. Lower aggregate demand could ultimately weigh on corporate earnings, particularly in highly cyclical industries that are more sensitive to consumer discretionary spending.

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This scenario could increase default risk in corporate debt markets, but there are reasons to believe infrastructure debt will remain more robust given its cyclically resilient features.

Infrastructure debt performance in cyclical downturns

Infrastructure assets are traditionally quite resilient to cyclical slowdowns due to inelastic demand for their services. This is because infrastructure assets are essential to the smooth functioning of daily life, providing services like electricity, heating, water supply and transport. They are not completely immune to cyclical slowdowns, but the impacts should be less severe than for corporations that are leveraged to discretionary consumer spending.

From a credit perspective, infrastructure businesses are judged to be resilient to rising inflation as they often have contracted pricing mechanisms that are linked to inflation, and the ability to hedge the cost of business inputs given the long life of their assets and relatively stable, predictable inelastic demand.

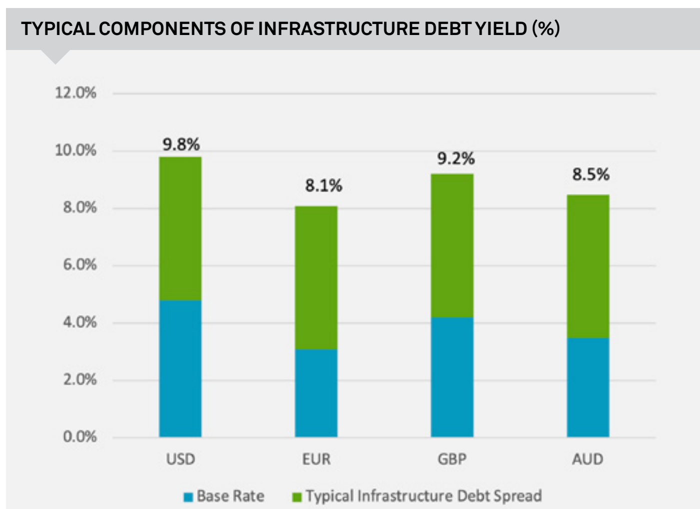
Whilst it is true that the valuation of fixed rate assets will be impacted by rising interest rates, a stable credit profile held to maturity should help to ensure that investors receive all principal and interest and realise the expected yield to maturity of an infrastructure debt investment throughout its life.

In addition, a lot of infrastructure debt deals are floating rate structures, which can help investors manage duration risk and allow them to benefit from rises in baseline interest rates. This is particularly true of the sub-investment grade market where a higher percentage of deals are based on floating rates, and tenors are typically in the 5 to 10-year range.

This increase in the yields on offer should make infrastructure debt investments more attractive to investors. While currency hedging could impact returns for investors in different parts of the world, current local market yields are shown in Figure 2. These yields are based on a sub-investment grade spread expectation of 400-600bps (for B through BB+ rated deals), along with associated up-front arrangement fees. We would expect the recent volatility in credit markets to continue to impact infrastructure debt spreads in the coming quarters, as the private markets tend to react with a delay to public market spread movements. However, we believe relative value against liquid corporate spreads should continue to be an important part of private infrastructure debt investment analysis.

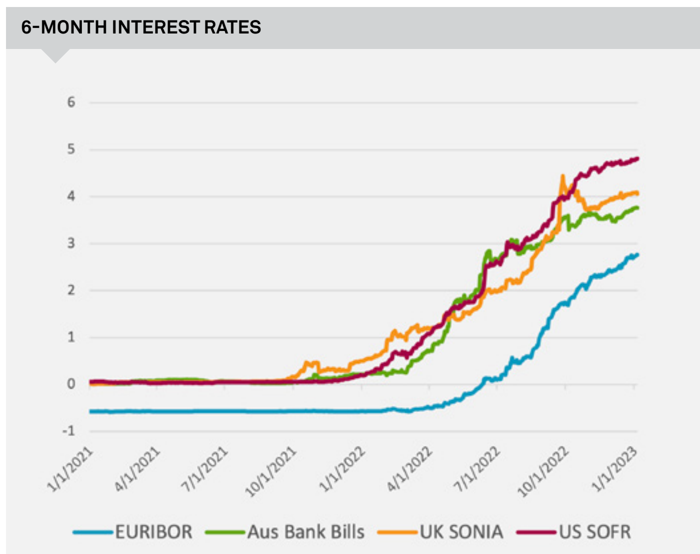
FIGURE 2 COMPONENTS OF INFRASTRUCTURE DEBT YIELDS

TYPICAL COMPONENTS OF INFRASTRUCTURE DEBT YIELD (%)



Source: IFM Investors, Bloomberg. As of 17th March 2023. Base rates used are, EURIBOR, Aus Bank Bills, UK SONIA, and US SOFR.

6-MONTH INTEREST RATES



Source: Bloomberg

Will there be a credit default cycle?

While public market credit spreads ground tighter during the beginning of the year, investors have been questioning whether we could see an uptick in credit defaults. The recent bank industry turmoil, which can in part be linked to the effects of higher

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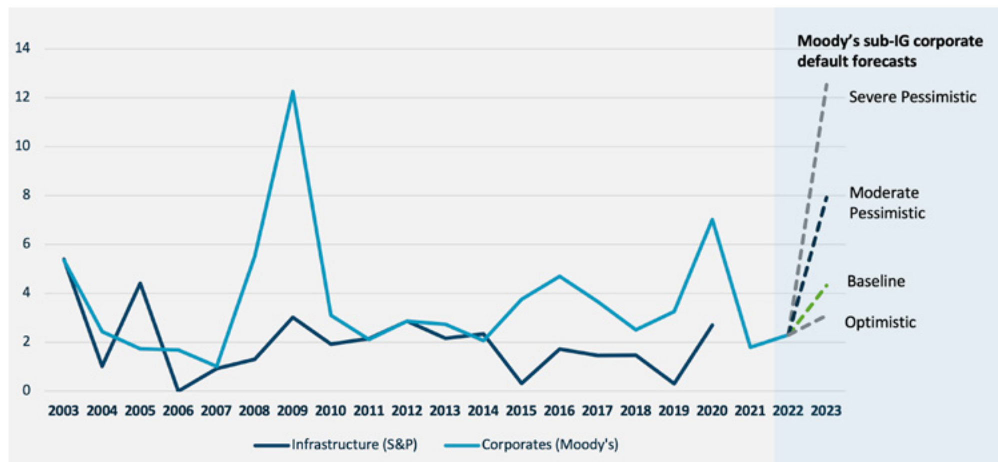
FIGURE 3 GLOBAL SUB-INVESTMENT GRADE DEFAULT RATES (TRAILING 12-MONTH)



Source: S&P, US Bureau of Economic Analysis (BEA), Moody's, IFM Investors, US Federal Reserve, DoT, MSCI, Bloomberg, HIS Markits. Past performance does not guarantee future results

interest rates, could be an early sign of things to come and credit spreads have repriced wider partially to reflect potentially rising default risk. Naturally, a big question on investors' minds is how much of the credit universe could be impacted. Figure 3 shows a range of possible default forecast scenarios from Moody's Investor Service at the start of 2023. The "baseline" forecast is for only a small rise in speculative grade defaults, with only the more pessimistic scenarios, which are now looking less likely, pointing to a more significant spike.

Under most of these scenarios, we expect infrastructure debt deals to remain relatively resilient and this is supported by Figure 3 which shows that infrastructure credit defaults have historically tended to stay relatively low during periods when corporate credit defaults have moved higher.

To avoid credit incidents in the infrastructure sector in the current environment, we believe it is important to be prudent when taking certain risks. For example:

- We are generally more reluctant to lend to greenfield projects if there is a significant risk of recession and when considering such opportunities, we pay particular attention to assessing the equity sponsor and constructors' experience.
- It is important to be prudent when considering technology risk in the current environment, so we prefer to invest in tested/proven technologies that we understand well.
- There is the potential for regional differences in credit performance and opportunities given differing economic conditions across regions and individual countries.

Secular tailwinds driving attractive opportunities

Against this challenging macro backdrop, we believe the following two secular trends are creating significant new opportunities for investors across investment grade and sub-investment grade infrastructure debt markets:

1 Increasing government investment in infrastructure

In recent years, a new wave of government investment in infrastructure has emerged in response to two key developments – recovery efforts from the COVID 19 pandemic and the pressing need to decarbonise the global economy to reduce climate change risks.

Infrastructure investment was a key feature of many pandemic-related government stimulus packages across developed economies, as governments matched the immediate need to stimulate weak growth with the longer-term imperatives of decarbonisation and modernising ageing and outdated infrastructure. For example, the UK government announced £100bn in infrastructure-type spending for 2021-22

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to help build roads, rail and fibre, amongst other investments, to make the British economy more resilient as part of the 'Build Back Better' plan.

Similarly, in the US, the Biden Administration has been successful in passing legislation that invests over US$1 trillion in improvements to America's infrastructure. The Infrastructure Investment and Jobs Act includes historic support and funding for public-private-partnerships at the state and local level. Coupled with the renewable energy provisions in the Inflation Reduction Act, we can expect generational investments to be made in the US' transportation and energy infrastructure over the next decade and beyond.

Increasing government infrastructure spending can bolster the whole infrastructure investment ecosystem and create opportunities for long-term debt investors. This is because infrastructure financing is nearly always more heavily weighted towards debt than equity, with debt often accounting for over 60% of the required capital. So the potential for new infrastructure debt deals of significant size is greater.

Government support for infrastructure can also reduce the risk associated with debt deals as the investment can come in the form of direct capital investment, or other forms such as guarantees or paying for infrastructure services. As government policy and priorities continue to be enacted and we see an evolution in preferences for a sustainable economy, the supply of attractive infrastructure debt opportunities should continue to increase.

2 The enormity of the energy transition and energy security

The entire energy system is expected to undergo a profound and deep transition in the next two decades. The International Energy Agency estimates the annual investment required to achieve net zero emissions by 2050 is around US$2.8 trillion over the decade to 2030[1].

There is a strong nexus between infrastructure debt investments and sustainability, mainly due to the investment required to achieve this huge energy transition and supportive government investment policies that aim to increase the supply and use of renewables. For example, the European Parliament recently adopted a new target which seeks to raise the share of renewables in the EU's energy consumption to 45% by 2030, and many individual European governments also have their own pro-renewable policies and plans. We expect more of these public policy decisions in Europe and other developed economies in coming years, underpinning the supply of renewable transactions in the market.

Volatile energy prices have also heightened the need for increased energy security at the country-level and this is another potential driver of new investment. For example, gas has historically been viewed as a transition fuel, but the Russian invasion of Ukraine has disrupted supplies and significantly increased gas insecurity, particularly in Europe. This may accelerate renewables investment as a means of reducing the reliance on imported gas.

Energy security concerns are also impacting at the individual company level,

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[1] International Energy Agency (2021), Net Zero by 2050, IEA, Paris

stimulating a trend towards corporate power purchase agreements, where companies agree to long term contracts at fixed prices direct from energy generators. Such agreements can help reduce risk from a lending perspective, although to some extent this involves swapping market price risk for corporate credit risk and this can limit the amount of real de-risking that is ultimately achieved.

To meet this growing supply of new deals, we continue to also see strong investor appetite for deals which focus on sustainability. Investments within widely adopted renewables sectors, such as solar and wind, which tend to be investment grade-rated, have been more resilient to widening spreads. We are seeing attractive value across the credit spectrum in sustainable opportunities beyond renewable energy investments such as electric buses, district heating, battery storage, biomass, and waste management solutions.

This link between infrastructure debt and sustainability is so strong that we believe that some investors are starting to view investing in infrastructure debt portfolios as an alternative to using pure-play sustainability-specific strategies.

Sectoral opportunities for investors

We believe there will continue to be particularly attractive relative value opportunities in sub-investment grade infrastructure debt in the coming year as this segment of the market is less trafficked by regulated entities, and it encompasses many project finance opportunities that are supported by the secular tailwinds mentioned above.

AT IFM we are originating opportunities in a broad range of sectors:

- **Energy transition** - the global shift away from fossil fuel powered energy generation to renewables, including wind, solar, hydroelectric, storage and renewable natural gases (biogas and landfill gas).
- **Electrification of transport** - a key theme where we have made several investments and continue to see interesting opportunities in the pipeline. These include electrification of buses, ferry fleets and rail, as well as the necessary infrastructure to support electrical charging of these transportation assets.
- **Energy efficiency** - opportunities include district heating, power networks, interconnectors and smart meters.
- **Environmental management** - opportunities include water utilities, waste to energy and recycling facilities which are critical services for society.

The following case studies illustrate some of the opportunities on offer in these sectors using recent infrastructure debt investments that IFM has been involved in.

CASE STUDY

European electric bus company

This investment was a 5-year, floating rate BB+ rated HoldCo loan. The proceeds were used to facilitate the acquisition of the largest fleet of electric buses in the Nordics which is fundamental to the region's net-zero transportation strategy.

The deal includes ESG-linked margin adjustment based on sustainability KPIs and benefits from stable contracted revenues from over 100 government public transportation authorities. The average life of the contracts is about six years.

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CASE STUDY

US battery storage asset

This investment was a 5-year, fixed rate, BB- senior secured loan associated with a battery storage asset that helps enable the use of renewables to power the electric grid in California during times of peak energy use. It is the second-largest battery energy storage system in the US, supporting 30 million customers across more than 26,000 transmission lines.

The project benefits from having 25% of its revenues under contract with a large investment grade rated utility, under a 20-year resource adequacy contract. The project also helps support California's target of achieving 50% of the electricity grid being powered by renewables by 2050.

CASE STUDY

UK onshore wind farm

This investment comprised a 4.5-year, fixed rate, BB HoldCo loan associated with onshore windfarms in the UK. The company is already operating, with a 10-year track record and 28MW of installed capacity which is enough to power 56,000 homes.

The assets are considered long-life as each of the windfarms has seven turbines with design lives of 20-25 years. The deal also has multiple revenue sources, including long-term power purchase agreement (PPA) contracts with IG rated energy retailers in the UK.

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Albena Vassileva
Executive Director
Infrastructure

Mandeep Mundae
Executive Director
Infrastructure

Energy transition as a means to energy security

Energy security is a pressing priority around the world given the sharp rise in energy prices that has been exacerbated by the Russian invasion of Ukraine and recent OPEC+ policies. Strengthening energy security is a key focus of governments' energy transition policies and should serve as a further accelerator of the net zero trend. We expect this to create compelling investment opportunities across the global infrastructure landscape.

by Albena Vassileva & Mandeep Mundae

INFRASTRUCTURE INSIGHT

Short-term fixes temporarily unavoidable

Europe is grappling with a near-term shortage of energy sources and supplies following Russia's hostilities. In this environment, security-linked energy initiatives are aimed at identifying reliable gas supplies from "friendly" countries to reduce the dependence on Russian gas. Coined "friend-shoring", this is being achieved in the near term by building new pipelines and/or increasing LNG imports. Some recent examples include:

- new gas pipelines and LNG export terminals being developed in Norway
- renewed focus on LNG import terminals across Europe, including Germany, Netherlands, UK, Poland, and the Baltic states.

However, these are only interim measures designed to address this crucial pressure point in the existing energy system. The real focus of policymakers remains on fostering the long-term transition to clean energy sources that also contribute meaningfully to energy security.

Long-term solutions are the main game

The entire energy system is expected to undergo a profound and deep transition in the next two decades. The International Energy Agency estimates the annual investment required to achieve net zero emissions by 2050 is around US$2.8 trillion over the decade to 2030. This is split across different energy sectors as shown in Figure 1.

This transition is likely to create a variety of investment opportunities across the infrastructure asset class, many of which will be inextricably linked to energy security. The key themes on which we are focusing include the trend towards reliably sourced

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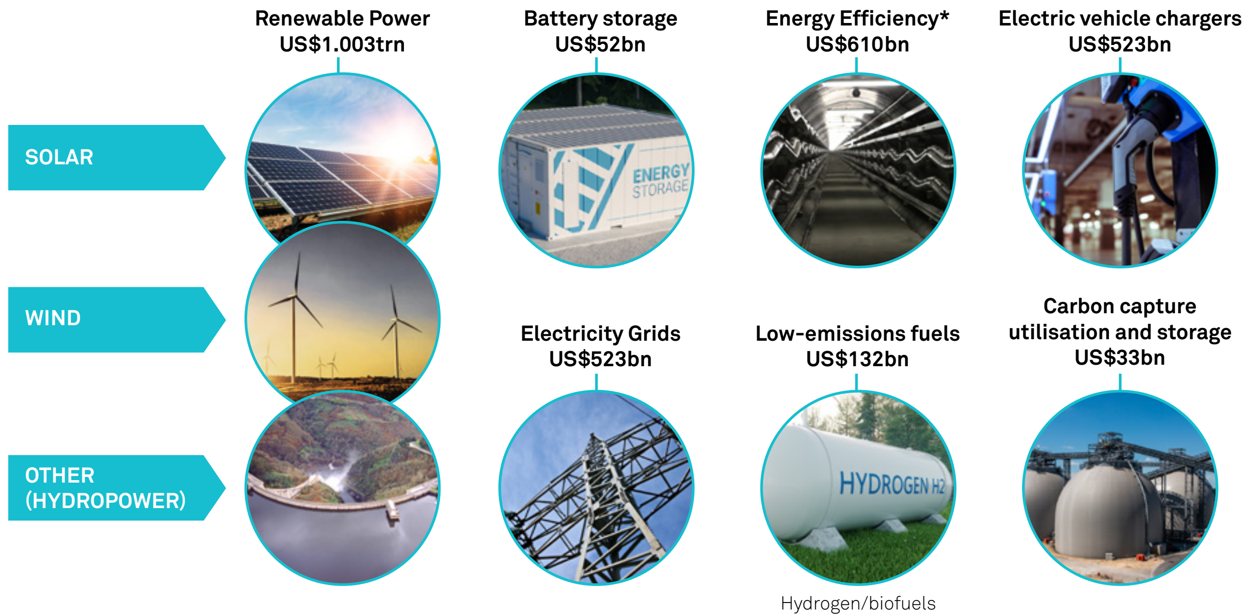
FIGURE 1 GLOBAL ANNUAL INVESTMENT TO MEET NET ZERO

The transition to net-zero emissions by 2050 requires unprecedented levels of annual investment in the decade to 2030 across the energy ecosystem.



Source: International Energy Agency (2021), Net Zero by 2050, IEA, Paris
* Energy efficiency investments relate to the incremental cost of improving the energy performance of equipment relative to a conventional design

electricity to enable the electrification of industries and transport, green hydrogen to replace gas, as well as the resurgence of onshoring in developed economies, which is likely to require carbon capture technologies to deal with the near-term emissions implications.

Security and stability of electricity generation

Electrification is a key net zero trend across many infrastructure sectors, but the electricity that is required needs to be securely generated in order to increase energy security. Countries are already taking three key approaches to achieving this goal and we expect these trends to continue and, in some cases, accelerate.

1 Renewables and storage

Interest in renewable energy was already high due to climate concerns but with the recent rise in global instability, renewables are now seen as a very effective way to increase energy security. Governments globally are increasing targets for renewables in the electricity mix and promoting easier permitting at the national and local levels.

Technological advances are also speeding this trend, with an increased focus on offshore wind, which can deliver significant step changes in installed capacity and does not carry the same "visual pollution" concerns as onshore wind. Historically, offshore wind was only possible in countries with relatively shallow and stable seabeds that could securely hold the mounted turbines. More recently, floating offshore wind farms have been developed and this is enabling the more widespread use of offshore wind technology.

Further advances in battery technology will also be a significant driver of demand for renewables as a secure energy source. The sooner locally produced renewable power can be stored in significant volume, the more countries will be able to rely on it for clean electricity generation.

2 Intra-country connectivity

Electricity can only travel between countries if there is interconnectivity through cables and this is being explored and promoted by appropriate policies in Europe and globally. Connectivity enables the sharing of electricity between countries and, in conjunction with storage, provides

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a reliable, fast and secure way to distribute renewable energy to where it is needed from where there is a surplus.

Whilst several neighboring markets in Europe have enjoyed interconnected grids, new projects are being implemented at a fast pace. For example, in 2021 Norway and Germany connected their electricity systems through NordLink, which – at 623 kilometres – is Europe's longest direct power link. A number of interconnector projects are underway linking the UK and Ireland, and the European Union has set a goal of at least 15% of its electricity systems to be interconnected by 2030.

3 Selective resurgence of nuclear

The analysis of local electricity generation would not be complete without touching on nuclear power which is used by some nations as a well-tested and low emissions source of base-load power.

However nuclear power is a divisive topic globally. Not all countries are in favour and many asset managers are not able to invest in nuclear-related infrastructure. This is well illustrated in Europe, where France and the UK are pro-nuclear, the Netherlands sits in the middle and Germany is largely against. Interestingly however, Germany may soften its stance temporarily due to the impact of Russia's Ukraine invasion. This suggests selective nuclear generation projects may emerge in the future, but the investment implications remain unclear.

Green hydrogen to replace natural gas

Green hydrogen[2] is only in its infancy but we believe it is a dominant theme for the future. There are strong national and EU policies aimed at developing reliable sources of green hydrogen to replace natural gas, and across the Atlantic, green hydrogen projects also featured strongly in the actions recommended by the recent US Inflation Reduction Act.

Heavy industrial activities, like steel and cement, are not easy to electrify, hence green hydrogen is seen as a viable, clean alternative to their current reliance on fossil fuels. Key chemical industries are reliant on natural gas as feedstock, which can be replaced by hydrogen.

Green hydrogen-related infrastructure, including generation, transport and storage, is potentially a significant investment opportunity as hydrogen can play a pivotal role in the net zero transition of industrialised economies such as Germany, the UK, Italy, Japan, Korea, Singapore and the US.

Not all of these countries can produce

PORTFOLIO EXAMPLE

Renewables in IFM Investors' portfolios

IFM Investors has made several renewable investments during the recent period of disruption in European energy markets. These companies offer low-cost electricity, and we also believe the increasing recognition that renewables offer greater energy security should provide a further engine for growth in clean energy capacity across Europe in the coming decades.

ERG S.p.A is a diversified European renewables platform with an established portfolio of 2.5 gigawatt (GW) across wind and solar. It has attractive growth credentials, with a near-term 3.5GW pipeline and a high calibre management team, underpinned by a 500-strong workforce with industry leading experience.

Nala Renewables is a global renewable energy platform headquartered in the UK, targeting 4GW of renewable capacity across wind, solar and battery storage by 2025. The company is targeting projects contracted to long-term power purchase agreements (PPAs) which help reduce counterparty and re-contracting risk. It also has access to proprietary deal flow through a partnership with Trafigura.

Together, ERG and Nala have more than 150 assets secured across 15 countries.

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PORTFOLIO EXAMPLE

Energy security behind-the-meter

At a micro level, energy security at individual infrastructure assets can be significantly improved through behind-the-meter renewable energy programs that also contribute to reducing assets' carbon footprints. Many IFM portfolio companies are well-advanced along this pathway.

IFM portfolio companies' combined behind-the-meter capacity totaled 182.44 megawatt (MW) at end 2021, up from 160.19MW in 2020. This represents a 14% increase over the year. There is also a significant pipeline of new projects that will come on stream across our portfolios over the next five years.

Vienna Airport - A 24-megawatt peak (MWp) capacity solar farm came online at Vienna Airport in May 2022. It is expected to generate 30,000 megawatt hours of clean energy annually, which will help drive operational cost savings and reduce emissions associated with this essential asset's energy consumption.

Anglian Water - A 11.6MW capacity solar PV array came online at the company's Grafham site in late 2020. The solar array is expected to generate approximately one quarter of the site's annual energy requirements and save around 3,500 tonnes of carbon each year.

Melbourne Airport - Melbourne airport's 12MW solar farm extends across 19 hectares (approx. 26 soccer fields), making it the largest behind the meter solar farm at any Australian airport. The facility is capable of generating 17 gigawatt hours of renewable energy each year, which is equivalent to the amount of energy required to power approximately 3,600 homes.[1]

cheap, reliable green hydrogen, so many will rely on imports from "friend-shoring" countries to help ensure energy security. This suggests export projects in geographies such as Canada, US and Australia are well placed to benefit from the green hydrogen revolution.

Onshoring and carbon capture

The Covid pandemic and geopolitical tensions involving China clearly highlighted the risks associated with offshore production as supply chains came under pressure. Severe supply shortages highlighted unfavourable economic dependencies that needed to be addressed at the national level. This has prompted a resurgence of domestic industrial policies aimed at bringing production back onshore in some of the major developed economies.

A key example is the US, where there are now government incentives for local production of equipment (such as solar panels and batteries) and tax incentives that encourage businesses to source locally. These policies aim to reduce economic dependence whilst improving energy security.

In addition, the slower pace of offshoring, or even the potential return of heavy industries to developed countries, will likely increase the need for, and investment opportunities associated with, carbon capture technologies. This reflects the need to deal with the rise in emissions that results from onshoring.

Carbon capture is likely to be sought as a solution until the green hydrogen market is more fully developed, enabling these heavy industries to fully transition to the net zero world. Recent EU and US policies have been highly supportive of carbon capture, recognising its place in a realistic transition to net zero. We expect this to foster infrastructure investment opportunities, including transportation and storage of CO_2, as well as distributed carbon capture models.

[1] https://www.climatecouncil.org.au/resources/watts-watt-a-guide-to-renewable-energy-capacity-and-generation/
[2] Green hydrogen is produced by splitting water into hydrogen and oxygen using renewable energy or low-carbon power. It is associated with very low emissions compared to grey or blue hydrogen that are produced using fossil fuels.

ifm investors

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INSIGHT

Managing infrastructure safety requires long-term focus

Providing a safe workplace is a primary focus for infrastructure assets and for IFM Investors as an asset owner. This is important because infrastructure environments typically involve interaction between a combination of large civil structures, operating equipment, transportation and a range of people – workers, customers, suppliers, tenants, visitors, and community members.

by Shannon O'Keeffe, Will Phillips and Nicholas Rivera

For IFM, the safety and wellbeing of people is one of our most important obligations and underpins long-term potential value creation in our assets. Therefore, in complex infrastructure environments, like the ones IFM assets operate in, our commitment to safety must be lived every day.

The main goal of workplace health and safety programs is to reduce injuries, death and hardship for workers, site users, their families, and employers. Developing a cooperative approach to ensuring high levels of safety can also benefit businesses by[1]:

- Improving product, process, and service quality
- Enhancing workplace morale
- Improving recruitment and retention standards
- Enhancing the confidence that customers, suppliers, governments and communities have in the way the business is operated (ie. social licence to operate).

The United States' Occupational Safety and Health Administration (OSHA) estimates that the indirect costs of poor workplace safety are at least 2.7 times the direct costs due to:

- Time lost from work stoppages and investigations
- Training and other costs associated with replacing injured workers
- Loss or damage to material, machinery, and property[2].

Achieving a high level of Occupational Health & Safety (OH&S) within a company requires a shift in company culture, and changes to the behaviours and mindsets of everyone at the site from being reactive, after an injury or illness has occurred, to identifying and fixing issues before they may cause an injury or illness. This requires a commitment to continuous improvement through engagement with

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[1] SHPM_guidelines.pdf (osha.gov)
[2] SHPM_guidelines.pdf (osha.gov)

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multiple stakeholders over extended periods of time to help ensure all those who interact in our workplaces understand our interdependence in achieving safety outcomes.

External factors also present challenges to infrastructure assets maintaining safety standards, as they require both companies and people to adapt to maintain operational resilience. The COVID-19 pandemic, and the increasing frequency and exposure to severe weather events arising from climate change, are both prime examples.

Some of the key themes we believe are impacting the long-term management of safety at global infrastructure assets include:

- Safety is everyone's responsibility
- Facilitating a consistently strong safety culture across assets regardless of the local context
- Climate change impacts safety
- Technology can enhance safety
- Strong safety cultures can deliver better business performance.

Achieving a high level of OH&S within a company requires a shift in company culture

Safety is everyone's responsibility

The structure of the workforce employed at infrastructure assets can be complex as there are often different groups of people on site (e.g. employees, contractors, tenants, government agencies such as customs and immigration, customers and other third parties), over whom the asset has varying degrees of control. This can meaningfully affect safety outcomes.

- An asset has significant influence over its directly employed workforce. Safety practices for these workers can be improved directly by the asset and may include cultivating a positive safety culture, enforcing rules on site, providing mandatory training, conducting in-depth reviews and taking remedial action following accidents.
- Contractors and sub-contractors may or may not be directly engaged by the asset. They can be high turnover employees with limited experience of working on site. Their safety approach may rely on the training provided by another party (eg. the contracting company), which may not fully align with the asset's safety culture and approach.
- There may also be third parties or customers who come on site over whom the asset has no contractual control and who may have had no safety training. For example, customers using a toll road, passengers at an airport or transport company drivers accessing a port.

The second and third categories mentioned above can pose as much of a safety risk – if not a greater one – than the risk associated with direct employees of the asset. For that reason, we dedicate significant effort to mitigating these risks.

Whilst most infrastructure assets develop and disclose safety procedures that apply to all people who may have access to any given site, the key challenge is their application and ensuring those procedures are understood and complied with by everyone. Given the interdependence between parties, a high level of collaboration is required between the stakeholders and the asset owner/operator is pivotal to leading this process. We mitigate this risk in several ways, key amongst them being:

A Training and induction against very clear standards and expectations that

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underpin our culture and work practices.

- **B** Collaboration and communication, involving multi stakeholder work committees with a focus on information sharing and problem-solving shared safety opportunities to align safety cultures and expectations.
- **C** A keen focus on procurement processes and arrangements to give ourselves, where possible, rights to oversight, supervise, audit and sometimes intervene in circumstances where a third party has failed to meet our safety culture, training and performance expectations.
- **D** Where the risk warrants it, we invest in our own additional resources to closely supervise the higher risk activities that we rely on other third parties to perform (eg. major construction projects).

The example below details how two IFM portfolio companies with port assets enhanced the safety of indirect workers in their operating environment during the COVID-19 pandemic.

Facilitating a consistently strong safety culture across assets regardless of the local context

IFM expects its portfolio assets to set and enforce high safety standards. A key challenge faced by some of our assets is local environments where the safety culture is not as advanced and where there are multiple language and literacy levels present on site.

For example, developing countries have different levels of maturity in legislating for workplace safety and workers may have less training and education about creating a strong safety culture. In some regions, for example, it is not compulsory for contractors to wear Personal Protective Equipment (PPE) when operating heavy machinery and the required PPE may not be supplied by the employer.

Such divergences in safety maturity across countries present challenges for asset managers with global infrastructure portfolios who want to achieve consistent high safety standards globally. To help overcome this, we believe all infrastructure assets should have a long-term strategy and training program to achieve a high safety culture that may require differentiation from the local environment. Each asset's approach will have similar fundamental steps but should consider the very different starting point they are moving from to inform how best to achieve outcomes. This approach is likely to provide a much better chance of successfully embedding long term changes in behaviour. Over time this should contribute to improving the local workplace culture.

Port Botany

Improving safety during the pandemic

During the COVID-19 pandemic, Australian ports NSW Ports and Port Botany abided by Australian government vaccine mandates for port staff and also worked with local health authorities to offer vaccines to seafarers coming through the port. While NSW Ports did not have direct responsibility for the seafarers employed on ships berthing at either Port Botany or Port Kembla, it recognised the risk posed to and by these workers who had limited access to vaccinations and long waiting times between doses as they were often working on vessels for months at a time.

During 2021-22, NSW Ports helped vaccinate 1,500 seafarers from 85 boats visiting Port Botany, with a similar initiative then rolled out at Port Kembla and provided by health authorities across the country. This initiative helped ensure that vaccinations were available to seafarers who came into contact with the ports. This was viewed as a necessary procedure to maintain workforce safety and help reduce the risk of an outbreak.

Aleatica safety journey

IFM portfolio company Aleatica owns a portfolio of transportation infrastructure assets in Latin America (Mexico, Peru, Colombia and Chile) and Europe. The company faces safety challenges as legislative, societal and cultural safety standards in Latin America are much lower than those experienced in developed nations. For example, driving under the influence, speeding, and lack of seatbelt usage are prevalent regional behaviours. Aleatica's safety approach must therefore incorporate stakeholders beyond its own employees.

These underlying challenges were identified at acquisition, and the asset team correspondingly has actively engaged with management to drive improvements since then. Immediate steps were taken during transition to begin the safety journey, including centralising safety accountability under the COO, linking executive remuneration to safety outcomes, and building out the safety function within the company. These early actions provided Aleatica with a baseline from which to seek continuous improvement and pursuit of best practice.

Through the formation of the Safety Steering Committee ("SSC"), which includes representation from IFM, COOs from our portfolio toll roads, and IFM's senior toll road advisor, Ken Daley, a multi-year Safety First Plan was created which provides the foundation for our targeted safety program. The Safety First Plan aims to develop a "Safety First" culture within the company, and key programs include Near Miss Reporting, Job Hazard Assessments, Stop Card authority, contractor Mandatory Safety Requirements and site safety tours. These efforts have contributed to a 70% reduction in global Aleatica employee lost time incidents, and an 81% reduction in the Mexican region[3].

Beyond the footprint of its own operations, Aleatica's safety approach extends across stakeholders. Aleatica's safety plan is guided by an Accident Reduction Program, which is a multi-year initiative to invest in road safety improvements, as well as invest in community initiatives alongside NGOs such as the Mexican Red Cross. In addition, Aleatica inaugurated the Aleatica Safety Foundation, which will seek to partner with the private sector, public sector, and NGOs with an aim to halve roadside fatalities in Mexico by 2030.

Though there is a long journey ahead, the impact of this broad safety program has the potential to be profound, improving the safety of Aleatica employees and contractors by elevating safety standards and practices, customers, and communities through investment and direct engagement, and improving the practices and aspirations of other companies operating in places like Mexico.[4]

Aleatica

[3] 2022 figures vs. 2018 acquisition

[4] Aleatica management have evidence that the enhanced safety practices implemented with contractors in Mexico have been replicated at non-Aleatica worksites.

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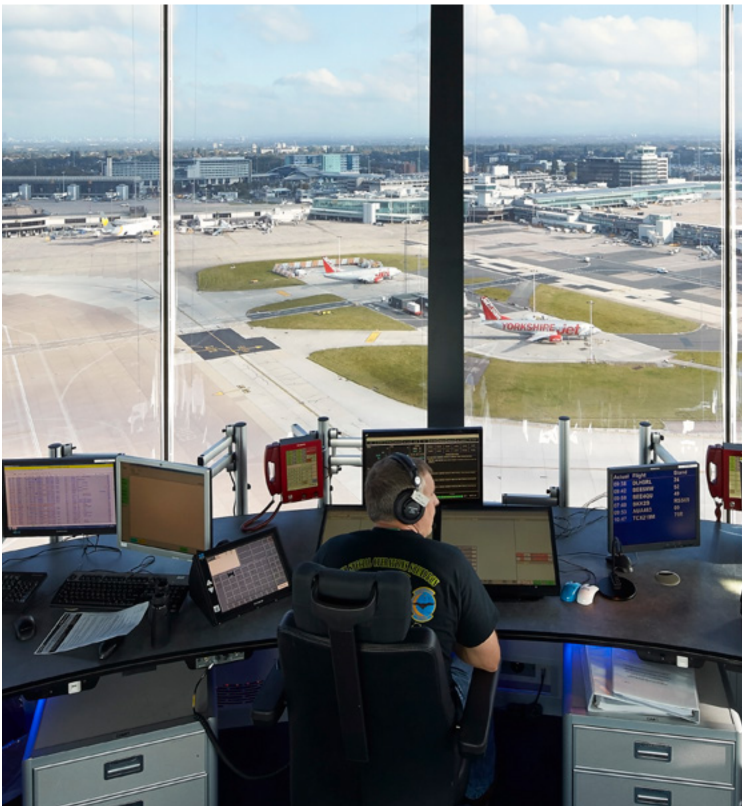
Dramatic technological changes are providing the potential for a step change in the way infrastructure safety is managed.



Manchester Airport

Climate change impacts safety

Climate change is increasing the severity of weather events that can physically affect infrastructure assets. In response, assets are having to adjust their risk management and existing controls to help ensure they can continue to operate at the same level safely.

For infrastructure asset managers, this means adapting existing assets so that they can withstand more damaging and frequent extreme weather events and making sure that new infrastructure is built with climate considerations in mind. This is in line with the ninth UN Sustainable Development Goal to build resilient infrastructure.

Advances in computer modelling are helping infrastructure assets address potential weather impacts that pose risks to the safety of the working environment. For example, ports may consider implementing technology that models how and where heavy winds impact containers on site. This would allow them to proactively address any heightened safety risks from container falls, as winds become increasingly severe due to climate change, and a one-in-100-year storm could become one-in-ten-year event.

Technology can enhance safety

The current era of dramatic technological change provides the potential for a step change in the way safety is managed across infrastructure assets. This is because technology can create new ways of implementing and monitoring safety behaviours and can, at times, help prevent safety incidents from occurring.

Smart electronic monitoring systems are used to improve security and safety across many of our airports, for example, by helping identify anomalies in passenger movements through terminals which could be connected with suspicious activity.

Intelligent transport systems (which can include a combination of technologies such as road sensors, electronic signs, variable speed signs, automatic lane management/ closure systems, electronic signage, CCTV cameras) can significantly enhance safety on our roads. This was demonstrated when Indiana Toll Road implemented edge-computing from California-based Extreme Networks Inc. to reduce the number of traffic incidents on the route by 30%.

Other examples of safety-enhancing technologies across our infrastructure assets include the use of drones to monitor key electricity grid assets and the use of infrastructure monitoring sensors to indicate major changes to elevated road structures.

Strong safety cultures can deliver better business performance

Whilst investments in safety help improve the overall physical and psychological wellbeing of workers, customers and others who rely on our infrastructure, they can also safeguard returns for investors by helping to ensure that capital is proactively invested in prevention, rather than paid in fines, compensation and repairing damage.

A safe workplace is one that values its workers – workers who know they are valued are more engaged and higher engagement can translate into stronger business and investment performance.

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