ZEROING IN:
INVESTING TO DECARBONISE
OPERATIONAL INFRASTRUCTURE

A report for the UK-China Green Finance Centre

July 2020
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FOREWORD
As the world seeks to recover from the Covid-19 pandemic, it is clear that institutional investors have a considerable role to play in building back better and capitalising a global green recovery. This means proactively allocating capital to a whole of economy transition, opening a frontier beyond efforts in risk management and disclosure. This is a challenge that we encourage investors to take up through the ESG Leaders Forum.

Sustainable infrastructure investment will be core to a global green recovery, and critical to maintaining growth in the UK, in China, along the Belt and Road, and all emerging markets. Sustainable infrastructure has been a central focus for multilateral development banks and commercial banks. However, current infrastructure investment efforts primarily focus on new and greenfield projects. The transition of the existing infrastructure base – a sizable chunk of emissions – has received much less attention. Moreover, it is existing assets where institutional investors have the most exposure.

Transitioning privately owned operational infrastructure is the next frontier for green finance. Investors must rapidly unpack the implications of the low carbon transition and identify new opportunities for their existing infrastructure assets. With the UK embracing a legally binding Net Zero target by 2050, and the European Union and over a hundred countries to follow suit, the clock is ticking.

Delivering Net Zero across the global economy will require significant cooperation between the public and private sector. Sector-level transition pathways are necessary to give investors the clarity and confidence to act at the pace required. But for now, the specific pathways and actions are yet to be defined.

This report aims to support private investors to unpack sectoral decarbonisation opportunities and to strategically decarbonise their infrastructure portfolios. Working with experts in Turner & Townsend, we have drawn out the implications of Net Zero for investors and outlined a program of action to accelerate progress, to manage climate risk, and to capture the opportunities of a green recovery.

The challenge of investing in sustainable operational infrastructure is pertinent for UK and Chinese asset owners and managers. Covid-19 is accelerating the demand from investors for sustainable investments. Investors need to meet this demand with action and robust sustainability-focused strategies.

These unprecedented times offer us a unique opportunity. Building back better is both the challenge and our goal. It is one we must strive for together.

Sir Roger Gifford
Co-Chairs, UK-China Green Finance Centre

Dr Ma Jun

July 2020
ABOUT THE UK-CHINA GREEN FINANCE CENTRE

The **UK-China Green Finance Centre** is the evolution of a long-standing partnership between the City of London Corporation’s Green Finance Initiative (GFI), which ran from 2016 to 2019, and Green Finance Committee (GFC) of the China Society for Finance and Banking.

The GFI-GFC partnership – which became known as the UK-China Green Finance Taskforce – has rapidly accelerated awareness of green finance opportunities in China and identified critical regulatory and market barriers to mainstreaming green investment flows.

With support from the UK Government’s Partnering for Accelerated Climate Transitions (PACT) programme, this partnership has now been formalised under the banner of the UK-China Green Finance Centre.

The Centre’s overarching mission is to enhance UK and China green finance cooperation to accelerate the global transition to an environmentally sustainable future.

The Centre is co-chaired by Sir Roger Gifford, Chair of the UK Government’s Green Finance Institute, and Dr MA Jun, Chairman of the Green Finance Committee (GFC) of the China Society for Finance and Banking.
EXECUTIVE SUMMARY
Sustainable investing has experienced rapid and unprecedented growth over the past few years. Capital markets have gone from strength to strength – global issuance of green bonds and loans grew by 49% in 2019. However, green equity and debt remain a small component of total issuance, leaving considerable room for further growth. To close this gap, more needs to be done to identify opportunities to decarbonise and to accelerate progress along transition pathways. Despite some progress – European sustainable funds hold more than €668bn in assets – decarbonisation in the real economy remains subdued. The financing gap yawns wide, with substantial challenges constraining the mobilisation of private capital.

Consensus coming out from the current global crisis is that sustainable investing will only accelerate. The Covid-induced economic downturn has demonstrated both the resilience of an ESG investment strategy, and offered a glimpse of the scale of investment which will be required to build back better while maintaining a focus on Net Zero. Together, these factors will motivate asset managers to create new investment products to attract sustainability-aligned mandates.

To leverage this opportunity, investors will need to enhance the scale and sophistication of their sustainable investment allocations. However, as a recent report by Mercer has shown, ESG strategies across a range of asset classes remain relatively underdeveloped. As a consequence, demand for sustainable investments may go unmet, starving essential real economy transition projects of capital. Across asset classes, real assets, particularly sustainable infrastructure strategies are considered a priority for accelerating progress.

Infrastructure strategies lend themselves well to sustainability. The readiness with which these strategies can incorporate ESG risks, coupled with the imperative of a green recovery, should see privately financed sustainable infrastructure take on a renewed focus. This trend will be reinforced by the exposure of private infrastructure assets to transition risk as more countries adopt Net Zero and double down on emission reduction targets. Six countries including the UK have already legislated Net Zero targets, with four jurisdictions, including the European Union, set to follow. Another dozen countries have embedded Net Zero into policy as ambition rises on the road to COP26.

A significant component of the global carbon footprint resides in the existing infrastructure base. Yet operational infrastructure receives considerably less attention and focus than renewables from investors and policymakers alike. A greater emphasis must be placed on operational infrastructure assets and how investment strategies can support their decarbonisation. This approach would unlock additional private investment to accelerate real economy transitions. Significantly, a sophisticated investment approach to decarbonising operational infrastructure also offers investors differentiation from the growing trend of pure play renewable funds.

1 Climate Bonds Initiative 2020, Green bonds issuance hit $255 billion in 2019.
2 Morningstar Research: Record-shattering Year for Sustainable Investments.
3 Blackrock: Sustainable Investing Amidst Uncertainty.
4 Mercer: Resilience: Lessons to Scale Responsible Investing.
5 Energy & Climate Intelligent Unit 2020, Net zero emissions race.
This report seeks to unpack how investors can respond to calls for a green recovery by proactively reorienting their infrastructure strategies to retrofit operational infrastructure. Much of the foundation to support sustainable investment strategies has already been defined—the financial materiality of ESG risks is gradually entering the mainstream and the need for consistent ESG disclosure is widely acknowledged. However, as a recent survey by Macquarie Infrastructure and Real Assets (MIRA) shows, the challenge is how infrastructure investment strategies and processes should adapt to integrate sustainability.⁶

It is only by unpacking how to integrate sustainability into infrastructure strategies that long term value can be realised by investors in the age of climate change.

To overcome the barriers investors face in crafting differentiated approaches for operational infrastructure, we seek to answer three questions:

1. What are the investment implications of Net Zero for operational infrastructure?
2. What are the current challenges for decarbonising operational infrastructure in key sectors with high levels of private ownership?
3. How can the UK and China motivate investment leadership through infrastructure strategies?

This report draws on interviews with investors and asset operators across the infrastructure value chain. The scope of the analysis is deliberately focused on the UK due to the high proportion of privately owned infrastructure and the immediacy of a legislated Net Zero target. Many of the observations however are likely to apply to other markets. An overview of the infrastructure sectors researched for the purpose of the report is included in Annex A.

The interviews reflected a clear understanding from investors that Net Zero will have profound implications for infrastructure, particularly in markets with high levels of private ownership of infrastructure assets. There was considerable appetite to further explore these implications. We suggest that the ESG Leaders Forum should prioritise engaging with investors exposed to operational infrastructure in the UK, China, and beyond.

This report identifies five core barriers to retrofitting infrastructure investment strategies at scale to accelerate the decarbonisation of operational infrastructure. We make 11 recommendations for members of the ESG Leaders Forum to take forward in conjunction with policymakers.

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<th>5 Core Barriers</th>
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| 11 Recommendations |
Awareness of ESG and the investment implications of Net Zero remains low.

Asset owners and managers remain on a spectrum of awareness with regards to key ESG risks, particularly the physical and transition risks arising from climate change.

Although some asset owners are earmarking Net Zero as a priority, it is less clear that the sectoral implications of Net Zero are a feature of regular asset management reviews. Instead, there is a tendency to focus on pure play green assets, such as renewables. As a consequence, asset owners are failing to adequately prepare for a whole-of-economy transition.

1. The ESG Leaders Forum should convene infrastructure investors to discuss sectoral pathways to Net Zero, and the steps they are taking to decarbonise their existing portfolios.

2. Asset owners should review their sectoral exposure to Net Zero and evaluate their existing mandates to align with a whole-of-economy transition.

For example, members of the Net Zero Asset Owners Alliance.
Regulatory structures have not adapted to Net Zero and create perverse incentives for investors.

A lack of synchronisation between Net Zero targets and the way this objective is integrated into sector-specific regulation is creating perverse incentives for investors. As a consequence, asset operators do not prioritise transformative decarbonisation measures aligned to Net Zero.

For example, regulated Asset Management Plans for water and energy are based on a 5 year investment horizon. Infrastructure operators prioritise investments that delivers returns within a 5 year payback period and will struggle to reconcile regulated incremental change with the paradigm shift of Net Zero.

3. Infrastructure regulators should review incentives for decarbonisation, proactively identify perverse incentives, and work with investors and asset operators to develop a new regulatory settlement that allows for long-term and strategic decarbonisation investments.

4. The ESG Leaders Forum should support investors, particularly cross-border, to engage with policymakers as the regulatory framework is updated to integrate Net Zero.
A lack of consistent sector-level standards inhibits effective origination and progress evaluation efforts aligned with transition pathways.

Harmonisation of green standards is a common issue across the investment landscape. However, within the infrastructure asset class, the absence of sector-level standards inhibits effective origination and progress evaluation. As a result, capital is not efficiently allocated to value-enhancing decarbonisation efforts.

Outside of the real estate sector, several climate and ESG-related infrastructure standards exist (e.g. GRESB Infrastructure Asset Assessment, Science-Based Targets initiative). Investors use these and other standards to evaluate prospective and current portfolio companies. However, there is not yet a consensus on standards regarding carbon performance for certain sectors (e.g. water).

5. The ESG Leaders Forum should work with asset owners and managers, in conjunction with policymakers and industry bodies to accelerate consensus and use of sector-specific performance standards.
Portfolio-level initiatives to decarbonise infrastructure assets rely on a sophisticated understanding of stewardship as a value enhancer.

Although ESG is increasingly a driver for investors and active ownership has been a hallmark of value creation, ESG integration in the portfolio management of infrastructure assets remains underdeveloped. Most infrastructure assets are co-owned, and a shared view of climate risk exposure and stewardship is critical to effective asset-level decarbonisation.

Realising value from the shift to Net Zero will rely on managers interrogating the transition potential of all their assets. Careful consideration of retrofit investments will position portfolios for growth.

6. Asset managers should set portfolio-level decarbonisation targets and actively work with their underlying assets to support their transition. To achieve this, managers should baseline emissions for each asset, set Science-Based Targets for emissions reduction, and identify enabling solutions without compromising on returns.

7. The ESG Leaders Forum should work with the UK’s Financial Reporting Council to curate best practice examples of stewardship for infrastructure strategies. Examples should capture:
   a. Working with portfolio companies to set credible decarbonisation targets and to identify new capital raising opportunities to facilitate strategic investments in decarbonisation.
   b. Differences between majority and minority holdings, recognising that infrastructure investors are likely to have considerably more influence over portfolio companies than equity investors in public markets.
   c. Stewardship of listed infrastructure portfolios.

8. The ESG Leaders Forum should explore how it can support Chinese regulators and asset managers as the infrastructure Real Estate Investment Trusts pilot commences. The pilot focuses on energy, water, utilities, and municipal waste – all assets with significant decarbonisation potential.

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8 IFM Investors’ Infrastructure Carbon Reduction Initiative is an example of this direction in practice.
Transition-enabling technology solutions are not scaling fast enough across the infrastructure base.

At present policy uncertainty, portfolio complexity, and payback periods are all barriers to adoption of innovative technology solutions that would facilitate the decarbonisation of operational infrastructure assets. Moreover, some investors lack a sophisticated understanding of the thematic growth opportunities associated with sustainability tailwinds. In addition, some technologies remain unproven at scale and policymakers should do more to de-risk these. As more investors integrate ESG into their portfolio management approaches, demand for technology-enabled solutions and services will rise.

9. The ESG Leaders Forum should support sector-level analysis of readily investable solutions and profile this with investors.

10. Infrastructure regulators should actively engage investors to demonstrate new technologies necessary for the transition to Net Zero. This could draw on Ofgem’s experience of a hydrogen demonstrator project with Cadent Gas. Regulators might also consider flexibility to facilitate investments over multiple asset management periods.

11. Infrastructure investors with diversified strategies (e.g. venture capital/private equity) should explore investments in technology solution providers. For example, Arcus Infrastructure Partners acquired Horizon Energy Infrastructure, a smart meter provider.
THE INVESTMENT CASE FOR UPGRADING THE INFRASTRUCTURE BASE
In this chapter we highlight the systemic importance of private investors – particularly institutional capital – in delivering Net Zero and decarbonisation.

In several key markets, private investors own a considerable share of the existing infrastructure base that must transition to deliver a low carbon future. There is evidence that investors are increasingly considering their exposures to climate risk.

However, more proactive efforts need to be taken to align investment portfolios with the practical solutions needed to make Net Zero a reality.

1.1 Private investors are central to the infrastructure value chain

In the world’s largest pension markets, investment in private markets and alternatives has increased from around 6% to 23% over the past 20 years, generally at the expense of bonds and equity allocations. Despite their increased governance requirements, alternatives have offered attractive returns as part of balanced risk portfolios.

Consistent with this trend, UK infrastructure assets have become highly attractive to institutional investors. Various indices rank the UK as one of the leading environments for infrastructure investment, offering stable, long-term revenue streams, backed by deep and liquid financial markets, strong legal and advisory professional services, and mature regulatory and policy frameworks.

Investors now own a considerable share of the UK’s infrastructure assets: from power and utilities to airports, ports and rollingstock. The proportion of private capital to public capital provision in most of the UK’s infrastructure sectors is significant compared to other developed markets (Figure 1).

**Figure 1: Source of infrastructure financing across major developed economies**

(Eunomia for National Infrastructure Commission, 2018)

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<th>Germany</th>
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9 Willis Towers Watson (2020) Global Pension Assets Study
10 For example, the CMS 2017 Infrastructure Index
11 PwC: The role and impact of specialist investors in UK infrastructure
Despite efforts to increase capital flows into new infrastructure projects, the majority of overseas private capital has been directed into the UK’s existing infrastructure base. To some extent, this reflects investor preference for operational assets which already generate positive and stable cashflow. Foreign shareholding of the UK’s operational infrastructure base stands at around 40%. China is a significant investor in UK infrastructure, investing around £11.7 bn between 2007 and 2013.

1.2 Decarbonising operational infrastructure is critical to achieve Net Zero

Low carbon infrastructure will be critical to meet commitments under the Paris Agreement. Globally, investment to decarbonise the energy sector alone needs to reach over $3.5 trillion per year through to 2050, roughly twice current levels of investment.14

The UK’s global leadership on the climate transition includes provides clear commitments to delivering deep decarbonisation. Five-year carbon budgets, recommended by the independent Committee on Climate Change (CCC), are prepared 12 years in advance to provide long-term visibility to investors. Sector-based contributions and pathways to achieve each budget are determined by separate policy processes.

Carbon budgets and interim targets provide a credible long-term trajectory to Net Zero and this approach has already been adopted by other international markets. Recent reforecasts by the UK National Infrastructure Commission and CCC provide an indicative trajectory to Net Zero and unpack the implications for each sector.15 As the analysis makes clear, the scale of change is immense and will fundamentally impact every sector. At present, sector-level transition plans that highlight key financing needs are still to be developed.

Significantly, for global investors, the Net Zero target will require a further decarbonisation of privately held infrastructure, such as energy, heat, surface transport, and aviation. The UK is the first major global economy to advance this far towards Net Zero, and the first economy where major infrastructure sectors will remain in predominately private hands as the transition progresses.

Covid-19 is expected to accelerate the UK’s decarbonisation efforts. But it is clear that measures to decarbonise the UK’s economic sectors will need to go further and faster than in the pre-Covid-19 period. While the shape of policy on Net Zero is emerging, recent analysis by the CCC indicates existing technologies can deliver a 96% reduction in emissions, but that the UK is currently not on track to meet its fourth (2023-2027) or fifth carbon budgets (2028-2032).16

1.3 Mainstream investors are taking action, but need to go further

Investors have a key role in delivering the Paris Agreement and Net Zero. Building on the work of the Taskforce for Climate-related Financial

13 FT 2014, China set to invest £105bn in UK infrastructure by 2025.
14 IRENA 2017, Perspectives for the Energy Transition: Investment needs for a low-carbon energy system.
Disclosures, investors now recognise that climate change manifests as both physical and transition risks. These risks are increasingly integrated into ESG processes and investment decision-making. Between 2017 and 2019 alone, the application of ESG principles to at least a quarter of retail and institutional investors’ portfolios jumped from 48 to 75 percent. \(^{17}\) 91 per cent of infrastructure investors expect to focus more heavily on ESG over the next 5 years. \(^{18}\)

While investments in new green infrastructure (e.g. renewables, including offshore wind) are key, developed economies have a mature asset base that will require significant public and private investment to realign to a low carbon future. In the UK around 80% of current real estate assets will still be operating in 2050, and a similar or even higher percentage is expected for economic infrastructure assets as they tend to have longer operational lifespans. Yet current asset performance – individually and as a system – is not consistent with a low carbon future. This means that the bulk of private infrastructure will need to transition towards Net Zero.

Leading asset owners are starting to set interim targets for their investment portfolios. As reported by pension consultant Mercer, the Environment Agency Pension Fund (EAPF) is working to ensure at least a third (33%) of its investments are climate aligned by 2025. Many are also starting to engage with regulators on future policy or regulatory requirements.

Of particular interest to asset owners and policymakers is how private capital can finance deep infrastructure decarbonisation. Although different investment models and vehicles exist, investors can support decarbonisation in four ways:

**Enterprise level** – Investment in operational assets and equipment upgrades (e.g. water and energy sectors)

**Project level** – Investment in assets (e.g. through a project finance model) owned by others such as rail electrification

**Programme level** – Investing through new Government vehicles with Government cornerstone investment such as the Heat Networks Investment Programme or the Mayor of London’s Energy Efficiency Fund (MEEF).

**Development capital** – Investment in companies developing low carbon solutions such as hydrogen or carbon capture and storage (CCS)

While the types of solutions requiring capital investment are sector-specific, these can be broadly categorised as measures to manage energy requirements and emissions, through:

**Demand reduction and optimisation** – such as equipment controls, fabric upgrades, water metering;

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\(^{17}\) Deloitte 2020, *Advancing ESG investing: a holistic approach for investment management firms.*

\(^{18}\) Macquarie Infrastructure and Real Assets 2020, *MIRA ESG Survey.*
**Equipment efficiency** – such as variable speed pumps, rolling stock with regenerative breaking;

**Efficiency in process & distribution** – such as district heat networks, water treatment and leakage reduction

**Renewable energy generation** – for example, through on-site wind energy generation or waste heat recovery.

To reach Net Zero, NIC also indicate that investments in greenhouse removal technologies will probably be required. The technologies are likely to include biomass with carbon capture and storage, direct air capture, and afforestation/reforestation. Asset owners may therefore need to take a position on offsetting as part of investment strategies to manage residual emissions.

2 NET ZERO: IMPLICATIONS FOR INSTITUTIONAL INVESTORS
As Chapter 1 makes clear, operational infrastructure assets are a key exposure for asset owners and managers. Despite the increasing popularity of renewable infrastructure strategies and mandates, there remains a considerable amount of investment in base economic infrastructure, from airports and ports, to utilities and roads.

Consequently, now more than ever investors need to think about what Net Zero, and an accelerated decarbonisation pathway, could mean for their investment portfolios and fiduciary duties.

In this chapter we explore the specific implications for asset owners and managers of the global trend to Net Zero in infrastructure assets.

2.1 Implications for asset owners

Asset owners around the world – pension funds and insurers in particular – have been critical drivers in mainstreaming ESG in recent years. This shift has been accelerated by two core factors:

First, global regulation has recognised the materiality of ESG factors, particularly the financial risks inherent in climate change. Regulators are clarifying fiduciary duties, mandating disclosure (e.g. TCFD), and foreshadowing climate risk stress testing.

Second, clients are demanding more information about where their pensions and assets are invested and pushing for change.

Taken together, these trends have seen asset owners revise their investment beliefs to integrate ESG as a foundational concept, which in turn guides their policies and processes.

The most significant shift in the asset owner landscape has been the integration of ESG into portfolio considerations. This has seen asset owners respectively alter their investment strategy, manager selection, and monitoring approaches to align with new ESG beliefs.  

Net Zero is a relatively new concept for asset owners, but one that is quickly gaining ground. 27 institutions representing nearly $5 trillion assets under management have joined the Net Zero Asset Owner Alliance, which aims to support investors to transition their portfolios to reach Net Zero by 2050.  

The core challenge Net Zero presents to these progressive asset owners is methodological – having set a target, the challenge is how to measure progress and know what steps need to be taken to achieve it.

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At present, some investors appear to be seeking to deliver against their decarbonisation objectives through pure play green strategies. For example, granting new mandates to renewable energy funds, or exploring the potential of green bond funds. However, these opportunities are the lower hanging fruit. The bulk of opportunities will arise from assets in transition from brown to green. As such, asset owners need to consider the availability of transition-aligned products.

In parallel, asset owners need to understand how country-level efforts to deliver Net Zero may impact their portfolios. As of June 2020, 6 countries have legislated a Net Zero target, four jurisdictions (including the EU) are set to follow and another dozen have enshrined Net Zero into policy, with more than 120 other countries evaluating potential alignment. Efforts to meet Net Zero are relevant for infrastructure exposures given the necessary shift in the real asset base of each country to reach the target.

The key consideration for investors stemming from Net Zero is transition risk – risk created by policy shifts in response to climate change that can significantly alter asset values or raise the costs of doing business. Transition risk is typically captured as the Inevitable Policy Response, the expected regulatory change to keep economies below 2 degrees. For infrastructure investors, transition risk can also be thought of as regulatory-driven costs. These are typically factored into investment decisions, however, as policy efforts to decarbonise accelerates, clarity will increase on the precise nature and magnitude of these costs.

Net Zero is a manifestation of the inevitable policy response, but one that has yet to flow through into sector policy. Much of the implementation of the UK’s Net Zero target in sectoral policy is anticipated, but has not been signed into law. This matters because the bulk of privately owned infrastructure remains highly regulated, with price controls limiting investment and therefore constraining the ability of sectors to reach Net Zero. As a consequence, asset owners may have more exposure to transition risk than they anticipate.

At present, exposure will be confined to the limited number of geographies that have legislated for Net Zero. However, ahead of COP26 in November 2021, more regions including the European Union will enshrine Net Zero in law, with sectoral policy clarity and therefore greater clarity on the precise costs stemming from transition risk to follow. This implication is important for asset owners investing globally – for example, Chinese asset owners with exposure to infrastructure assets in the UK and Europe.

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22 Energy & Climate Intelligent Unit 2020, *Net zero emissions race*.
In 2010, Ofwat, the water regulator, estimated that the water sector in England and Wales contributed to around 0.7% of the UK’s greenhouse gas emissions. This is a result of the energy and chemical intensity of the industry within its operations and processes, including water and wastewater treatment, pumping, and transfers.

With the industry privatised, Ofwat regulates pricing, performance, and capital investment through 5 year Asset Management Plans. Water utilities are only permitted to make capital investments and upgrades agreed through this Asset Management Plan process, and these typically extend to 5% of the underlying asset base.

The most recent Asset Management Plan for the water sector does not reference Net Zero or align capital investment to this target. In addition, Ofwat does not provide a net-zero price reopener or other uncertainty mechanism to give flexibility for companies to bring forward strategic investment to facilitate net-zero. As a consequence, water utilities are currently limited in the practical actions they can take to decarbonise their operations.

The UK water sector demonstrates that the regulatory structures have not adapted to Net Zero and the concept of a climate-aligned stewardship is yet to be developed. Full ESG integration in the portfolio management of infrastructure assets will require water companies to double down on Net Zero investments in order to position their portfolio for growth.

The information asymmetry around Net Zero also promises upside. Infrastructure assets will be mispriced as their capacity to make the transition to a Net Zero future is assessed and implemented. There will be opportunities to gain exposure to capital raising from infrastructure companies to finance their decarbonisation journeys. We are already seeing some examples of this with green and transition bonds issued by major energy and water utilities in the UK and across Europe.

There are three core lessons for asset owners to draw from the transition to Net Zero:

- **Look beyond green opportunities**: the universe of pure play green funds is necessarily finite and will be subject to increasing competition for assets. Substantially more opportunities will be found in sectors in transition.

- **Evaluating Exposure**: asset owners should seek information from their asset managers on the exposure of their infrastructure strategies to Net Zero and mitigations they are employing. For directly owned assets, asset
owners should incorporate Net Zero into their climate change risk assessment and consider how they engage with policymakers to deliver the certainty they need to make appropriate investment decisions to align their portfolios with the Paris Agreement.

- **Manager Selection:** during manager selection, asset owners should seek detailed information about how a manager integrates ESG into their investment process. Given the duration of infrastructure strategies, a manager’s approach to portfolio management and the Net Zero transition will be critical.

### 2.2 Implications for asset managers

Demand from asset owners is pushing asset managers – particularly in the UK and Europe – to increase the sophistication of their ESG strategies. Net Zero represents a significant opportunity for enterprising asset managers. With nearly $5tn in assets under management already committed to Net Zero by 2050, and more expected, there is clear demand for new products and climate-aligned strategies.

Asset managers are responding to this trend with new sustainable infrastructure strategies. However, recent analysis by Mercer of 155 ESG-aligned infrastructure strategies shows that only 10% of ESG funds are close to best practice.\(^{25}\) This suggests considerably more must be done to retrofit the remainder of the infrastructure investment universe to integrate and embrace ESG.

A focus on sustainable infrastructure strategies poses a dual challenge for investors. First, as more asset managers adapt existing strategies with an ESG lens, retaining a differentiated edge in sustainability will become increasingly important to secure and retain a market-leading position. This is evidenced by:

- 75% of major infrastructure investors are also signatories of the UN Principles for Responsible Investment (UNPRI) and highlight the importance of ESG in their investment strategies.\(^ {26}\)
- Strong evidence that asset owners are taking an increasingly sophisticated approach to manager selection using ESG, a trend that is expected to continue.

The second challenge concerns how asset managers retrofit their existing infrastructure investments and assets to meet sustainability needs and Net Zero targets.

- Many recent sustainable infrastructure strategies have focused on new and greenfield projects, such as renewables.\(^ {27}\) However, diversification

\(^{25}\) Mercer 2020, Resilience: Lessons to Scale Responsible Investing.

\(^{26}\) Based on UNPRI signatory database and a review of ESG and sustainability reports from the Top 50 infrastructure investors by AuM in 2019.

\(^{27}\) For example: Mirova Energy Transition Fund, Greencoat Renewables, Brookfield Renewable Partners, Actis.
and pipeline may limit the potential growth of these strategies. Margins may also shrink as competition intensifies.

- Although there is evidence that infrastructure investors closely track ESG factors in their origination strategies, systematic integration of ESG into portfolio management – and therefore existing operational assets – is much less common.

- Annual climate change risk reviews, asset and portfolio-level decarbonisation targets, and actively implementing asset-level decarbonisation initiatives are emerging as best practice portfolio management measures, with the potential to support alignment with Net Zero.

Managers who seek differentiation should double down on their operational infrastructure strategies. Developing a sophisticated, transition-aligned investment thesis and clear asset-level transition plans will position managers well to engage with asset owners increasingly looking to deploy capital into sustainable strategies.

In parallel to these differentiation challenges, the transition risk associated with Net Zero may directly impact the assets held within infrastructure funds. Some assets may have limited potential to transition to Net Zero, either technically or within the regulatory environment. Existing assets with limited transition potential will become increasingly unattractive to long term investors. Managers will need to upgrade existing infrastructure to de-risk sunk investments, for example, pre-empting minimum standards or anticipated changes in Government policy.

The challenge for infrastructure investors is to quantify and price these risks into the long-term cash flow models that are used to evaluate and value prospective investments. Similarly, modelling of potential solutions to decarbonise specific infrastructure assets will require confident and consistent assumptions about avoided costs. This is a data-driven challenge for infrastructure investors, particularly given the extended time horizons over which their investment models stretch.

An accelerated Net Zero economy transition will also increase demand for enabling technologies, creating sustainability tailwinds. As Chapter one highlights, decarbonising the UK’s infrastructure base will require adoption of monitoring, demand reduction, and equipment and distribution efficiency solutions. For this reason, asset managers should consider the thematic origination opportunities that Net Zero will drive.

There are three core lessons for asset managers to draw from the transition to Net Zero:

- **Differentiation**: Net Zero will accelerate capital seeking ESG-aligned infrastructure strategies. Pure play green infrastructure (renewable) strategies are increasingly competitive. A new source of
differentiation can be found in transition-aligned strategies centred on decarbonising existing assets.

- **Portfolio management**: managing existing portfolios through the Net Zero transition will require asset managers to actively engage with asset-level decarbonisation challenges, and solutions.

- **Origination**: the Net Zero transition will unearth new investment opportunities. Asset managers could link the decarbonisation needs of their infrastructure portfolio with origination activity.
NET ZERO ACROSS KEY INFRASTRUCTURE SECTORS
The impacts of Net Zero will differ by sector. Understanding how key infrastructure sectors are positioned for decarbonisation is essential for investors.

In this chapter, we unpack the state of play for the aviation, rail, water, and energy sectors. The focus is to highlight sector-level barriers to achieving Net Zero and key solutions to accelerate decarbonisation at the infrastructure sector level.

3.1 Aviation

UK airports currently receive the majority of their investment from shareholders and private investors. 53% of the UK’s airports are fully private, 21.1% are fully public, and the remainder are under mixed ownership. Nearly all of the airports with private shareholding have at least some non-UK investors. Heathrow, Gatwick, Edinburgh, Bristol and several others source the majority of their funds from foreign investors.

The Aviation sector accounts for 7% of the UK’s GHG emissions, 95% of which are generated from aircraft. The UK Aviation industry has pledged to cut its net carbon emissions to zero by 2050, however, international aviation is not included within the UK’s Net Zero carbon emission target.

Several airports have committed to become Net Zero carbon airports. Heathrow specifically aims to achieve this by mid-2030, following the airport achieving carbon-neutral status for its buildings and infrastructure in February 2020. The key barriers associated with meeting this target include:

• Carbon emissions within the Aviation sector is challenging. At present solutions remain insufficient. Although biofuels are being researched and trialled, these are yet to be commercially and economically viable. The industry is suggesting further research is required under the EU Emissions Trading Scheme (ETS) Directive with the aim to propose a suite of mitigation measures.

• Lack of commonality between airports on environmental, social and governance (ESG) reporting metrics.

• Lack of specific policies driving net carbon zero initiatives.

Delivering Net Zero for airport operations will be driven by adoption of key investments such as onsite renewables, LED lighting, and electric airside vehicles and equipment. Although greater dividends would be realised by alternative aviation fuels or commercial electric aircraft, these solutions are distant.

There is a recognition that the extreme pressure that Covid-19 has placed on the

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28 The UK Government has since announced the formation of a Jet Zero Council to advise on the transition of the sector.
global aviation sector – with demand for air travel dwindling and airport revenues plummeting – may limit investor appetite to advance decarbonisation solutions.

3.2 Rail

The rail industry accounts for less than 2% of the UK’s transport emissions. The rail industry is highly regulated by the Office of Road and Rail, who place a large focus on embedded carbon within new infrastructure specifically. The Rail Industry Decarbonisation Taskforce (RIDT) handed its final report to the government shortly after the Net Zero target was announced in 2019. RIDT set out a strategy to phase out diesel trains by 2040, with the achievement of Net Zero a decade later.

However, several barriers exist for net carbon zero initiatives in the rail industry. Delivery of this target requires a considerable reorientation of the regulatory framework. There remain misaligned incentives and price controls which limit the extent to which infrastructure upgrades are feasible and fiscally prudent. This is a result of, but not limited to, the following challenges:

- Traditional infrastructure creating constraints to implementation of Net Zero solutions e.g. parking requirements.
- Limitations in traction and power generation for electric trains to be rolled out.
- Train operating companies lease rolling stock, and rely on Rolling Stock leasing companies (ROSCOs) to provide a low carbon alternative.
- Rail franchisees are charged a penalty if they do not provide the service required, potentially creating barriers to upgrading services whilst continuing to deliver under their licensing conditions.

There is a clear programme of investment in digitalising railways, electrification, railway station upgrades, and modal shift projects. There is also potential for ROSCOs to be open to investment as train operating companies begin seeking more efficient rolling stock to lease.

With the renationalisation of the rail franchises during Covid-19, the UK government has an additional set of policy levers with which to align the rail sector to Net Zero. However, considerable capital will be required to deliver these changes.

3.3 Water

The water industry is the first industrial sector in the UK, and one of the first major sectors in the world, to commit to a carbon zero future by 2030. Government funding for water companies is determined Ofwat, and awarded in 5 year asset management planning (AMP) cycles.

29 Water UK 2020, Water industry plans to reach net zero carbon by 2030.
The most recent settlement agreed in Q4 2019 made no reference to Net Zero as the strategy was largely set between 2016-2018 and before the Net Zero target was enshrined in law.

The next opportunity to influence AMPs is over the next two years in the run-up to 2024. To date, water companies have typically been incentivised around the construction of new infrastructure assets where efficient operation has typically been a lower priority. However, Water UK has been established by industry as a trade association to work on areas of common interest. It has published a public interest commitment to Net Zero by 2030, and is currently working on roadmap and resource pack for companies to establish their own pathway to Net Zero.

Although the water sector’s contributions to the UK carbon footprint are much lower than transport it still generates about 5 million tCO2 a year. Embodied carbon represents around a third of GHG emissions, which is driving water companies to evaluate how to reduce capital works and deliver water requirements by making better use of existing assets.

The core challenge for the water sector is how to align decarbonisation with regulatory constraints. There are three related regulatory challenges:

- Infrastructure investment including maintenance is controlled by five year asset management plans, which do not yet factor in Net Zero.

- The five-year time horizon of asset management plans also disincentivises water companies to make investments that deliver paybacks beyond five years. This forecloses transformative investment needed to position the sector for Net Zero.

- There is some misalignment between water policy objectives. For example, increased water quality required additional processing, which will increase GHG emissions.

There are also challenges around whether investments into facilities and equipment upgrades will deliver actual energy efficiency performance improvements. While many consumer products have a simple energy efficiency grading standard, and real estate assets have simple grading standards such as energy performance certificates or display energy certificates, there are no equivalent standards for water sector facilities or equipment. Bespoke approaches are being developed, but these do not currently act as sector-based standards or support comparisons across water companies.

The UK water sector has also been leading the way in green finance and invests billions of pounds per annum that could generate significant additional demand from institutional investors. A range of technical solutions could support both increased decarbonisation activities and institutional investment:

- On-site renewable energy generation.
• Energy efficient water pumps (water distribution) and blowers (water treatment).\textsuperscript{30}

• Leak detection and reduction.

There are also project finance models which operate outside regulated activities, such as licencing models (e.g. Thames Tideway) and contracting models (e.g. Direct Procurement for Customers). These project finance models are currently only used for large-scale and complex new build capital developments.

\section*{Financing Water Sector Decarbonisation}

Anglian Water has in place a Green Bond Financing Framework to provide sustainable financing for projects of different sizes and complexity, targeting carbon reduction, energy efficiency and reduction and demand management. Since it announced its first Green Bond in 2017, Anglian Water has funded 850 capital investment projects through Green Bonds to a total value of over £800 million.\textsuperscript{31}

Despite the challenges associated with the regulatory framework, Anglian Water has made a commitment to Net Zero by 2030. A core component of Anglian Water’s decarbonisation strategy, and a key financing focus of its green bonds, have been the deployment of onsite renewables. Leveraging biogas produced at its water recycling centres, Anglian Water have invested in Combined Heat and Power (CHP) engines across the UK, generating more than 100 GWh in 2018/19.

\section*{3.4 Energy}

The energy sector is the second largest contributor to the UK’s greenhouse gas emissions. There are several credible developments across the UK which can assist in the transition to Net Zero, however, there is a need for increased deployment and strong policy regulation. The CCC estimate that investment in the power sector may need to double to around £20 billion per annum by 2050 to achieve the target.

A vision for decarbonising the energy sector is set out in the Decarbonisation Programme Action Plan released by Ofgem, the energy regulator, in February 2020. The Action Plan acknowledges that in many areas the most cost-effective pathways to decarbonisation in line with UK target are uncertain, and investment needs are unclear. To address this, amongst other measures, it sets out:

• A commitment for a strategic innovation fund focused on decarbonisation.

\textsuperscript{30} Water companies are not currently incentivised to replace pumps or blowers within typical product life to reduce emissions.

\textsuperscript{31} Anglian Water 2019, Green Bond Impact Report.
• A review of the role of system operators to ensure they promote strategic planning of investment need and transmission/distribution and electricity/gas network coordination.

• The set-up of a Net Zero Advisory Group to consider changes to regulation to focus innovation and ensure price controls incentivise decarbonisation.

On 9 July 2020 Ofgem published a draft 5 year asset management plan for the energy sector aligned with Net Zero. The proposal highlights the transition risk in Net Zero, as the allowed return on equity has been reduced. It also underscores the tension regulators face between reliability, consumer prices, and Net Zero. It is worth noting that the UK’s energy regulators are further ahead of those in other sectors, which could be expected to follow a similar trajectory.

Ofgem’s asset management plan recognises that there are trade-offs and challenges to overcome:

• Fairly spreading the cost of a low carbon energy system between current and future consumers.

• Energy companies can afford to pay for carbon credits.

• Limited policy driving Net Zero.

• Investment models do not currently promote the transformation of the energy network to Net Zero.

Practical decarbonisation solutions primarily focus on renewable energy generation through the diversification of energy services. However, other solutions include carbon capture and storage, carbon offsetting, and altering the turbines within gas fired power station to generate heat recovery. Research is also being undertaken into more radical changes about how consumers interact with the energy system, for instance the possibility of buying heat as a service, and selling energy services routinely to the grid or directly to other consumers.

Transport electrification will increase the UK’s electricity demands. An Electric Vehicle Strategy is expected to be released by Ofgem that sets out how the grid needs to evolve to meet increased demand. The strategy will also look at new business models that can help manage demand, such as Electric Vehicle (EV) owners selling electricity back to the grid during peak times (i.e. Vehicle to Grid charging). However, the asset management plan is yet to alter current regulatory incentives that favour high certainty/low risk investments such as new assets that deliver increased revenue, or interventions that realise savings over a short period of time.

Despite this, the UK’s energy transition has been a focal point for institutional investors. Investors have expressed a strong interest in the transition of surface transport, heating, and power. Particular interest has coalesced around energy storage, electric vehicle charging infrastructure and integrating hydrogen into the gas and heating network.
Financing Energy System Decarbonisation

Cadent Gas, a UK-based Gas Distributor, made a commitment to Net Zero in 2019. In March 2020, Cadent issued the UK’s first Transition Bond. A key feature of the bond was to raise capital to support Cadent’s strategy to reach Net Zero by 2050. This strategy turns on retrofitting Cadent’s distribution network to carry hydrogen and reduce leakage.

However, Cadent is also managing the technology risk that is inherent in the deployment of hydrogen into the gas network. This demonstrates the importance of public and private capital jointly working to lower barriers to decarbonisation. Working with Ofgem and National Grid, Cadent has initiated several scalable demonstrator projects to prove the viability of hydrogen:

The HyNet North West Hydrogen demonstration project uses an established technology for extraction of hydrogen from natural gas combined with Carbon Capture Usage and Storage (CCUS). It is designed to reduce carbon emissions from industry, home and transport and save 1 million tonnes of CO2 emissions a year.

The HyDeploy project is seeking to demonstrate the safety of hydrogen as a replacement fuel for households.

3.5 Market-level barriers to decarbonisation

The above analysis highlights all reviewed sectors are engaged in planning how to deliver decarbonisation. Importantly, advice to the UK Government also highlights a range of growth opportunities and benefits from decarbonisation, in the form of both products and services, that can be capitalised upon with the right policies and investment.

Consistent with the sector-based analysis, interviews carried out for the report revealed that UK and Chinese asset owners commonly encounter three challenges:

• Limited signals or incentives from industry regulators to invest in decarbonisation.

• Limited information on the GHG footprint of the overall infrastructure sector, and for many sub-sectors together with a business case analysis of the transition to Net Zero.

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33 Cadent Gas is owned by a consortium of investors including: China Investment Corporation, Allianz Capital Partners, Hermes Investment Management, Amber Infrastructure Limited/International Public Partnerships, Dalmore Capital and the Qatar Investment Authority.

34 Grantham Research Institute on Climate Change and the Environment 2019, Decarbonisation of the UK economy and green finance.

35 This is likely because the Government’s Net Zero policy came in after AMP-funding strategies have been set.
• The absence of asset management strategies identifying clear targets, costs and pay-back periods for a phased transition to Net Zero.

Below, we unpack these challenges in turn.

3.5.1 Misalignment from sector-level regulators

Research and interviews identified that there is a lag between the national Net Zero target and expectations of industry regulators. The policy context and funding available to support decarbonisation is influenced to a large extent by independent industry regulators such as Ofgem, Ofwat and the Office of Rail & Road (ORR). The market has evolved into its current form based upon a series of drivers which, to date, did not include net-zero. As a result, the current market structure – of policies, regulation, standards, and procurement – are not aligned to mobilise, incentivise and accelerate decarbonisation.

Analysis emphasises that regulators have a crucial role in setting expectations and supporting asset owners and managers, and that while the current regulatory system does not need to be redesigned, it does need to be updated for Net Zero.

Figure 2 highlights examples where existing market structures may disincentivise ambitious infrastructure decarbonisation strategies.

Figure 2: Key regulatory impediments to decarbonising operational infrastructure

- Misaligned standards: Previously-set targets potentially create unintended consequences in certain sectors. For example, housing sector has set energy performance targets (Energy Performance Certificate ‘C’) that both use a dysfunctional energy performance standard that is based upon design rather than performance of an asset – suffering a well-evidenced ‘performance gap’. The targets themselves are also a 2030 incremental target which does not provide an on-going upgrade pathway to Net Zero, and so incurring abortive investment when needing to be replaced with net-zero solutions.

- Short AMP cycles: The 5 year AMwP cycle tends to incentivise investments with shorter payback periods. However much of the capital investment required to deliver decarbonisation can be paid off by savings (e.g. reduced maintenance, avoided energy costs, managed peak demand, etc) or other future payment structures.

- Regulatory lag: The latest AMP settlement for water does not specifically address specifically Net Zero as the funding strategy was finalised before the UK Government Net Zero policy announcement. Unless addressed, the water sector will not be ‘required’ to address decarbonisation until the next AMP starting in 2024.

Against this backdrop, investors are coming under increased scrutiny from financial regulators to evaluate their exposure to climate risk, to disclose this, and to reorient capital towards lower risk (greener) alternatives.

3.5.2 Poor availability of data (unlisted assets) and inconsistent standards

There are multiple energy and carbon performance standards within infrastructure sectors (e.g. for water and energy). As a result, investors can struggle to compare the carbon performance of assets during the origination process. In addition, there is no standard way to compare the efficiency of assets or the effectiveness of interventions. This complicates the selection of appropriate decarbonisation solutions and progress evaluation at fund level.

There is an opportunity to build on existing standards in the consumer goods industry, real estate sector and work undertaken by some water companies such as Welsh Water to set minimum performance standards within a sector. The formulation of a new standard would need to learn from experience of other sectors and ensure metrics can be applied at the design stage, and to actual operating performance.

3.5.3 Lack of investor-ready Net Zero roadmaps

Whilst there is a proliferation of industries and organisations articulating Net Zero targets, few provide a clear, investment-ready roadmap for how the target will be delivered.

Some sectors have set out generic steps for reaching Net Zero, often against competitive timelines. However these typically fall short of an investor-ready framework of actions that would, for example, outline technology-based measures, their economic viability and expected performance against a consistent set of standards. Where individual organisations are establishing Science-Based Targets with a ‘pathway’ profile of reduction, the reality is often that this reflects a target profile rather than a specific, committed plan.

As well as the challenges of regulatory alignment and inconsistent or misaligned sector-based standards, multiple factors are also beyond the immediate control of any one organisation or sector. In the decarbonisation of heat, for example, both government policy/investment and technical solutions efficacy are still evolving. However, there is much than can still be planned and delivered. The opportunity here is to support markets to develop a replicable framework of technically-viable, investable steps. This would be in a form that acknowledges both that there remain certain unknown solution elements, and that aspects of the delivery will necessarily be pushed out until they align with planned maintenance and upgrades.

This approach would support an acceleration of planning, promote visibility of investment opportunities and a consistent framework for investor decision-making. It would also provide a valuable platform for collaboration to seek co-investment funding to address ‘next generation’ challenges facing specific sectoral pathways – such as medium-term renewable energy storage or green production of hydrogen. In a wider sense it would also provide a market-level framework for sharing and promoting examples of leading practice.
PARTNERING TO RETROFIT INFRASTRUCTURE STRATEGIES AT SCALE
With 120 countries already committing to implement Net Zero, it is clear that operational infrastructure needs to be upgraded worldwide. Institutional investors are uniquely positioned to drive this agenda. Many asset owners have diversified exposure to infrastructure in countries with Net Zero targets and asset managers have both global and regional infrastructure investment strategies.

However, at present individual investors are approaching the challenge of retrofitting infrastructure strategies in isolation. This is an important step, but insufficient to deliver the real economy impact consistent with a green recovery and progress on Net Zero. Moreover, as the previous chapter demonstrates, many of the barriers investors face operate at a market level – they are challenging for individual firms to overcome. Investors need to collaborate and cooperate to drive change.

This chapter calls on leading investors in the UK and China to raise the profile of decarbonising operational infrastructure, and through the ESG Leaders Forum, work on developing solutions to align infrastructure portfolios with Net Zero.

4.1 **UK-China green finance collaboration**

The UK and China have a history of cooperation on green finance, dating back to the G20 Green Finance Study Group which inspired many countries to develop their green finance roadmaps. In the 9th Economic and Financial Dialogue between the UK and China, the UK-China Green Finance Taskforce was charged with accelerating green finance between the two markets. In 2019, the Taskforce was institutionalised and became the UK-China Green Finance Centre, co-chaired by Sir Roger Gifford and Dr MA Jun.

UK-China collaboration on green finance has delivered several milestone initiatives:

- **UK-China Climate and Environmental Disclosure Pilot**: bringing together major UK and Chinese banks and investors, the pilot has focused on the practical issues institutions face when implementing the TCFD framework. The pilot supported the first TCFD disclosures from several Chinese institutions.

- **Green Investment Principles for the Belt and Road (GIP)**: a set of 7 principles for investors to factor environmental risk and climate resilience into infrastructure projects along the Belt and Road. The GIP are focused on mobilising financial flows into green projects along the Belt and Road and supporting institutions to improve management of ESG risks.
A third priority area of collaboration has been the evaluation of ESG risks and their integration into long term investing. This has involved evaluating the link between ESG and the cost of capital, practitioner views on ESG implementation, and most recently, an analysis of lessons to scale sustainable asset allocations. This work has coalesced into the ESG Leaders Forum, a practitioner-led investor group focused on creating the necessary conditions to support mainstream allocations to sustainability strategies in the UK and China.

4.2 Enhancing value from China’s infrastructure investments

Green infrastructure is taking on a considerable focus within China’s domestic market. China is already a leading investor in renewables – $83.4 billion was invested in 2019. China has also announced the launch of a National Green Development Fund, with an explicit mandate to accelerate the deployment of green projects.

With substantial new infrastructure projects in the pipeline, project development should focus on delivering value across the lifecycle of each asset. This will require careful consideration and design features to maximise the operational performance of each new asset. In parallel, China must increasingly focus on its existing – albeit rapidly developing – asset base. Delivering long term value from infrastructure investments to date will rely on careful stewardship and prioritisation of decarbonisation objectives as they become policy priorities.

Infrastructure investment in China is growing. In its review of the global infrastructure landscape in 2019, Prequin identified strong growth opportunities, particularly for renewables. Many global infrastructure funds also have some exposure to China’s infrastructure base, particularly in real estate and energy, railways, and telecommunications. All of these assets have significant decarbonisation potential. However, there is limited evidence that either Chinese investors or global investors with some exposure to China have thought strategically about how these assets will transition.

Chinese investors should work with their co-investors to agree a common approach to decarbonisation at the asset level. This experience will assist Chinese managers to develop sophisticated decarbonisation strategies across their domestic and global portfolios. The availability of domestic sustainable infrastructure strategies beyond renewables will help to attract additional foreign capital and boost investor confidence. Managers developing these strategies will showcase their differentiation and position themselves well to engage with asset owners increasingly looking to deploy capital into sustainable strategies.

A recent, and potentially significant development for private investment in infrastructure in China, is expected later this year. Chinese regulators have

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37 UK-China Green Finance Taskforce 2017, Turning Green Momentum into Actions.
41 For example, Chongqing is currently evaluating how to achieve Net Zero by 2050.
announced a pilot of infrastructure Real Estate Investment Trusts (REITs). The pilot would be open to retail investors, who currently make up around half of China’s investment market. REITs rely on operational assets to provide a steady revenue stream and regulators have provided a strong steer that key infrastructure assets in water, energy, utilities, and municipal waste will be given priority. There is significant potential in each of these sectors for decarbonisation. Sustainability should be embedded in the pilot from inception.

For asset managers considering participation in the infrastructure REIT pilot, a sustainability-aligned strategy that seeks to drive value by improving the energy performance of underlying assets would create differentiation. There is already significant evidence of stewardship as a value enhancer for REITs. This is an area the ESG Leaders Forum could seek to explore in more detail.

4.3 Partnering through the ESG Leaders Forum

The ESG Leaders Forum has three priorities:

- First, demonstrating scalable investment solutions to build market confidence in sustainability strategies and in turn support more asset owners to shift their asset allocations. This requires a tailored approach to overcome barriers and challenges at the asset class level.

- Second, unlocking value creation through stewardship, and supporting Chinese asset managers to integrate their ESG risk assessments with active ownership strategies.

- Finally, underpinning these efforts with policy support and enhanced guidance, such as around disclosure.

The Forum will strive to achieve these priorities by bringing UK and Chinese investment professionals together to discuss common challenges, share respective approaches and experience, and to pilot solutions. Given the exposure of UK and Chinese asset owners and managers to infrastructure strategies, and the imperative of decarbonising operational infrastructure assets, there appear to be strong opportunities for collaboration.

As outlined, the challenges that inhibit the retrofitting of infrastructure strategies are substantial. However, the experience of leading asset owners shows that a partnership approach between owners and managers is the most effective way to evolve existing approaches, or develop the strategies needed to meet the needs of asset owners. In turn, this drives innovation and value creation.

43 NDRC and CSRC 2020, Circular on Work Related to Advancing the Pilot Program of Real Estate Investment Trusts.
FIVE KEY CHALLENGES AND SOLUTIONS
Based on our understanding of the challenges Net Zero presents to institutional investors and our analysis of key sectoral transition approaches within the UK, we have distilled five constraints that will limit the willingness and ability of asset managers to retrofit their infrastructure strategies at pace and scale.

Infrastructure will remain at the core of delivering Net Zero, and there is a clear need for renewed momentum. There is an opportunity for UK and Chinese investors to lead the development of new strategies, new products, and new solutions to bring Net Zero closer to reality.

In this chapter we set out 11 recommendations to support investors to decarbonise their infrastructure portfolios. We also provide practical examples of leading infrastructure operators and investors who have already taken the first steps on this journey.

5.1 **Awareness of ESG and the investment implications of Net Zero remains low.**

Asset owners and managers remain on a spectrum of awareness with regards to key ESG risks, such as those stemming from climate change. Although some asset owners are earmarking Net Zero as a priority, it is less clear that the sectoral implications of Net Zero have been a feature of routine asset reviews. Instead, there is a tendency to focus on pure play green assets, such as renewables. As a consequence, asset owners are failing to adequately prepare for a whole-of-economy transition.

While ESG criteria are to a much greater extent part of the investment decision-making process, it is still perceived as a qualitative value enhancer rather than a defined quantitative value driver behind investment returns. Many investors continue to make use of negative screening approaches, rather than embracing ESG integration.

Moreover, institutional investors, when evaluating investment opportunities use their proprietary scoring tools in which ESG criteria are applied largely to manage downside risks only (i.e. climate change, political and regulatory risk, consumer empowerment, data security, reputation) which would impact performance, value or credit rating.

Asset owners and managers are still not consistently seeking "alpha" for ESG performance, although there is an increasing pressure from their investors to demonstrate ESG compliance. Some investors have highlighted the challenges of quantifying some ESG factors into the long-term cash flow models infrastructure investors use to make their investment decisions.

It is clear, therefore, that infrastructure investors are yet to fully consider the investment implications of Net Zero. More needs to be done. There also
appears to be a risk for some asset owners, with specific or narrow exposures to infrastructure assets in OECD markets, that the regulatory costs linked with Net Zero may not be factored into their strategies.

1. The ESG Leaders Forum should convene infrastructure investors to discuss sectoral pathways to Net Zero, and the steps they are taking to decarbonise their existing portfolios.

2. Asset owners should review their sectoral exposure to Net Zero and evaluate their existing mandates to align with a whole-of-economy transition.

5.2 Regulatory structures have not adapted to Net Zero and create perverse incentives for investors.

The lack of synchronisation between Net Zero targets and their manifestation in sector-specific regulatory price control periods is creating mixed policy signals for investors and not incentivising immediate action.

For example, regulated Asset Management Plans for water and energy are based on a 5 year investment horizon and are yet to fully factor in Net Zero. As a consequence, asset operators prioritise investment within a 5 year payback period and will struggle to reconcile regulated incremental change with the paradigm shift of Net Zero. This may further complicate the ability of these assets to transition and may increase risk for investors.

It is clear from recent announcements from Ofgem that there will be a trade off between return on equity and the capital investment needed to deliver Net Zero. However, it is less clear that institutional investors are actively engaged in regulatory dialogues at a sector level. As Net Zero is adopted in more markets, and as Net Zero flows through into the regulatory frameworks of different infrastructure sectors, investors should support policymakers to optimise regulatory settings to spur investment into decarbonisation.

3. Infrastructure regulators should review incentives for decarbonisation, proactively identify perverse incentives, and work with investors and asset operators to develop a new regulatory settlement that allows for long-term and strategic decarbonisation investments.

4. The ESG Leaders Forum should support investors, particularly cross-border, to engage with policymakers as the regulatory framework is updated to integrate Net Zero.
5.3 **A lack of consistent sector-level standards inhibits effective origination and progress evaluation efforts aligned with transition pathways.**

Harmonisation of green standards is a common issue across the investment landscape. However, within the infrastructure asset class, the absence of sector-level standards inhibits effective origination and progress evaluation. As a result, capital is not efficiently allocated to value-enhancing decarbonisation efforts.

Outside of the real estate sector, there are multiple climate and ESG-based standards that cover infrastructure (e.g. GRESB Infrastructure Asset Assessment, Science-Based Targets Initiative, Greenhouse Gas Protocol Corporate Accounting and Reporting Standard). Investors use these standards and others to evaluate prospective and current portfolio companies. However, at present there is no consistent market standard for carbon for Real Assets that is widely adopted by institutional investors. Asset owners and managers are concerned that the range of standards available at present is not sufficient to ensure consistency in measuring, reporting and valuing ESG performance. Consequently, capital will continue to be allocated inefficiently and investors may be disincentivised.

Sector level performance standards – particularly for equipment – could draw upon the Energy Information Regulations 2011. This regulation requires an A-G rating for certain electrical consumer goods, based upon their energy efficiency (A = green/good; G = red/poor), accompanied with product performance data including energy use per annum. For facilities such as pump stations, or even water treatment works, the standards should be based upon the specified design and actual energy performance – combining the common real estate approaches of Energy Performance Certificates (EPCs – a design-based rating) and Display Energy Certificates (DEC – an actual metered performance rating).

This blended approach would provide asset owners with access to verifiable information on the designed and actual performance of portfolio assets—enabling them to assess future risk around Net Zero policy changes or requirements for investments in upgrades.

It also allows for a consistent set of standards to potentially be set to raise performance. An existing example in the real estate sector is the Energy Efficiency (Private Rented Property) (England and Wales) Regulations 2015. This requires non-domestic property landlords to ensure a minimum level of energy efficiency to lawfully market the property for rental. A standard such as this acts to provide confidence to the market and regulators on the long-term trajectory to deliver Net Zero.

**RECOMMENDATIONS**

5. The ESG Leaders Forum should work with asset owners and managers with policymakers and industry bodies to accelerate consensus and use of sector-specific performance standards.
5.4  **Portfolio-level initiatives to decarbonise infrastructure assets rely on a sophisticated understanding of stewardship as a value enhancer.**

Although ESG is increasingly a driver in infrastructure strategies and active ownership has been a hallmark of value creation for investors, ESG integration in the portfolio management of infrastructure assets remains underdeveloped. Most infrastructure assets are co-owned, and a shared view climate risk exposure and stewardship is critical to effective asset-level decarbonisation.

Realising value from the shift to Net Zero will rely on managers interrogating the transition potential of all their assets. Careful consideration of retrofit investments will position portfolios for growth.

The UK is a leader in stewardship. Increased expectations have recently been introduced in the 2020 Stewardship Code, under which asset managers are expected to extend their active ownership approach beyond listed equities. There are significant opportunities for asset managers to work together to agree a common approach to decarbonisation at the asset level consistent with the Stewardship Code.

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**IFM: Australian Infrastructure Carbon Reduction Initiative**

IFM is an Australian asset manager with AUD$156.1 billion assets under management. After evaluating climate risk across its investment portfolio, IFM undertook a review into how it could accelerate the decarbonisation of its Australian infrastructure portfolio. The result was IFM’s Carbon Reduction Initiative, which aims to protect investment value and returns by mitigating the future business risks associated with the transition to a low-carbon economy.

IFM has worked closely with the fund’s major assets and co-owners to establish emissions reduction targets and pathways through to 2030, although it is not currently aligned for Net Zero by 2050.

The Carbon Reduction Initiative involved a number of key steps, as outlined below:

1. Individual asset engagement by IFM’s Responsible Investment and Infrastructure Asset Management teams;
2. Establishing base-line emissions data for each asset;
3. Developing customised guidance and modelling tool aligned to Science Based Target (SBT) methodologies;
4. Modelling current emissions trajectories and identifying emissions reduction opportunities and costs;
5. Identifying the most efficient projects for emissions reduction;

6. Establishing FY2024 and FY2030 emissions reduction targets for each asset; and

7. Developing emissions reduction pathways for target achievement.

In addition to demonstrable multi-sector action in the form of targets and defined pathways, this initiative demonstrates a genuine active ownership approach.

Rather than simply directing assets to initiate programs to reduce emissions, this was, and continues to be, a collaborative and capacity-building exercise between a fund manager, asset co-owners and the asset operators. It is a great example of an investor building long-term value, rather than looking for ways to cut costs in the short term.

This initiative also sets an important example on transparency and accountability through publicly disclosed emissions reduction target commitments.45

6. Asset managers should set portfolio-level decarbonisation targets and actively work with their underlying assets to support their transition. To achieve this, managers should baseline emissions for each asset, set science-based targets for emissions reduction, and identify enabling solutions without compromising on returns.

7. The ESG Leaders Forum should work with the UK’s Financial Reporting Council to curate best practice examples of stewardship for infrastructure strategies. Examples should capture:

   a. Working with portfolio companies to set credible decarbonisation targets and to identify new capital raising opportunities to facilitate strategic investments in decarbonisation.

   b. Differences between majority and minority holdings, recognising that infrastructure investors are likely to have considerably more influence over portfolio companies than equity investors in public markets.

   c. Stewardship of listed infrastructure portfolios.

8. The ESG Leaders Forum should explore how it can support Chinese regulators and asset managers as the infrastructure REIT pilot commences. The pilot focuses on energy, water, utilities, and municipal waste – all assets with significant decarbonisation potential.
5.5 **Transition-enabling technology solutions are not scaling fast enough across the infrastructure base.**

At present policy uncertainty, portfolio complexity, and payback periods are all barriers to the adoption of innovative technological solutions that would facilitate the decarbonisation of operational infrastructure assets. Moreover, some investors lack a sophisticated understanding of the thematic growth opportunities associated with sustainability tailwinds.

In addition, some technologies remain unproven at scale and more can be done to de-risk these for investors. As more investors integrate ESG into their portfolio management approaches, technology-enabled solutions and services will become increasingly important to decarbonise infrastructure assets.

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### RECOMMENDATIONS

9. **The ESG Leaders Forum should support sector-level analysis of readily investable solutions and profile this with investors.**

10. **Infrastructure regulators should actively engage investors to demonstrate new technologies necessary for the transition to Net Zero.** This could draw on Ofgem’s experience of a hydrogen demonstrator project with Cadent Gas, which closely links with the Transition Bond issued by Cadent in March 2020. Regulators might also consider flexibility to facilitate investments over multiple asset management periods.

11. **Infrastructure investors with diversified strategies should explore investments in technology solution providers.** For example, Arcus Infrastructure Partners recently acquired Horizon Energy Infrastructure, a smart meter provider.
ANNEXES
Zeroing in: Investing to Decarbonise Operational Infrastructure

The report is informed by research, technical experts in Turner & Townsend and the investment management community, including interviews conducted by Turner & Townsend and the City of London Corporation with asset owners and managers in the UK and China.

The report builds on wider work by the UK-China Green Finance Centre to support growing interest among Chinese investors on how to integrate ESG into their asset portfolios.

A horizon scan of 5 infrastructure sectors revealed significant opportunities for investment. Key observations for each sector are summarised below.

**Aviation** – the aviation sector is proactive in investing in decarbonisation; however, the primary focus is on aviation fuel emissions which is not considered an investable infrastructure asset class.

**Rail** – the rail industry is largely publicly funded with a primary focus on electrification and digitalisation. These interventions are well understood and delivery programmes are underway, however the sources of financing and funding are yet to be confirmed.

**Water** – the water industry already attracts significant institutional investment and has significant opportunities to scale-up and accelerate decarbonisation.

**Energy** – the energy sector receives major institutional investment. Whilst the primary focus is on renewable energy generation or new technologies for carbon capture, there remains opportunities for a scale-up and acceleration of energy efficiency and renewable schemes through Energy Services Companies (ESCOs) that already attract significant institutional investment. New business models to manage energy demands from transport electrification are also being investigated.

ANNEX A: SCOPE OF THE REPORT

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ANNEX B: ACKNOWLEDGEMENTS

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