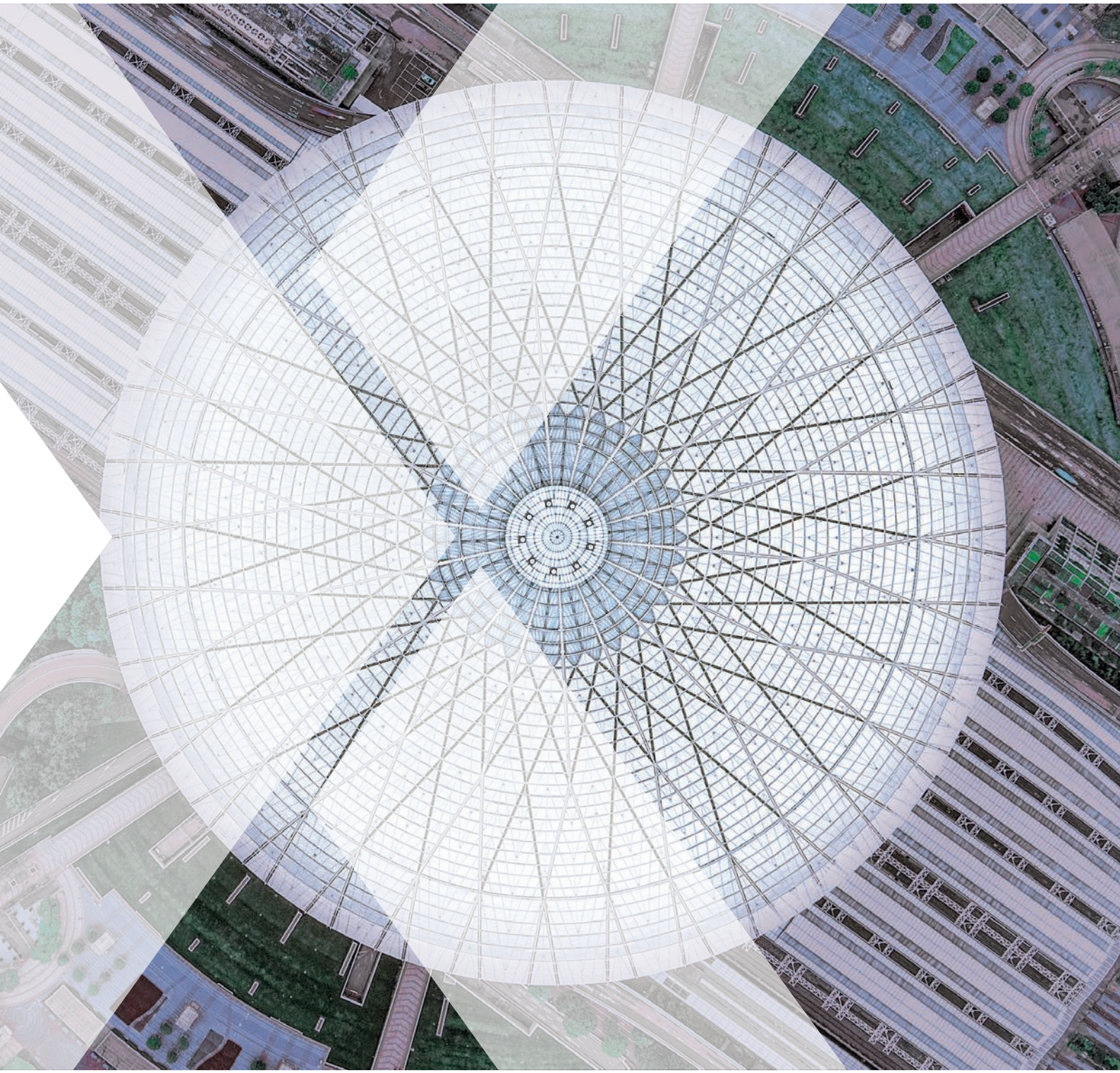
IMPAX Asset Management

Sustainable infrastructure

Enabling the transition to the new economy



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IMPAX Asset Management

We believe that investing in sustainable, inclusive and resilient infrastructure has never been more critical, creating a growing spectrum of long-term investment opportunities

Contents

Key points

1. Climate change, demographics and the impact of the COVID-19 pandemic are driving a new wave of infrastructure investment
2. The transition to a more sustainable economy not only requires new infrastructure, but also the replacement and substitution of ageing old economy infrastructure
3. Government policy and corporate and consumer demand are catalysing investment in sustainable infrastructure
4. An expanded opportunity set means listed equities today sit alongside debt and private markets as a viable mechanism for investing in infrastructure
5. The Impax Sustainable Infrastructure Taxonomy identifies long-term investment opportunities in listed equities
6. The transition to a more sustainable economy will be enabled by digital economy and social infrastructure as much as infrastructure that delivers clean energy and water
7. Listed infrastructure can offer relatively reliable income and a high dividend yield, compared to the overall stockmarket, and play a diversifying role within an allocation to equities
8. Sustainable infrastructure stocks have the potential to deliver long-term growth, help mitigate portfolio climate risks and deliver an impact

Introduction

Infrastructure is at an inflection point. In response to the rising urgency of climate action, demographic shifts and pandemic-induced fiscal boosts, we are witnessing a momentous shift in the nature of infrastructure investment.

Gone is the historical focus on infrastructure principally as a means of moving people and goods from A to B, and of providing electricity, heat and water. These aspects remain, but as part of a much broader understanding of what constitutes infrastructure today in the context of the transition to a more sustainable economy. Moreover, the modern economy is underpinned by more than traditional physical infrastructure: digital infrastructure is also integral to work and life today.

The implications of the sustainable transition are becoming clearer and more immediate. To keep climate goals in sight, global greenhouse gas emissions must fall by 45% by the end of this decade, compared to 2010 levels.[1] This demands a fundamental recalibration of the economy, so that living standards can continue to rise whilst carbon intensity dramatically falls. New and upgraded infrastructure will be key to tackling the drivers of climate change, from enabling the electrification of transport to more efficient grids.

There is also growing appreciation that global society must tackle a wider set of environmental challenges at the same time, by halting and reversing biodiversity loss and moving from a depletive economic model to a circular one that re-uses and recycles materials. Infrastructure investors can not only contribute significantly to these efforts but also benefit from new business opportunities linked to the sustainable management of the world's resources.

1 International Panel on Climate Change, 2019: Global Warming of 1.5°C

The modern economy is underpinned by more than traditional physical infrastructure: digital infrastructure is also integral to work and life today.

The COVID-19 pandemic has meanwhile brought social inequality, both within and between societies, into sharper focus. Government spending programmes to improve health and education should provide tailwinds for social infrastructure companies focused on solutions to society's evolving needs.

Sustainable infrastructure can help bridge geographic and societal divides and it can promote equity by improving access to communications, finance, healthcare, employment opportunities and other basic needs. Encouragingly, we believe the emergence of transformational technologies has the potential to deliver leaps forward in electricity generation, alternative fuels and data-led models for delivering more affordable, scalable public services.

Technological innovations form part of a broad opportunity set within sustainable infrastructure, and across asset classes. While private markets have historically been the way investors could access the infrastructure theme, there are expanding opportunities today throughout the infrastructure supply chain in both fixed income and listed equities.

We believe that investing in sustainable, inclusive and resilient infrastructure has never been more critical, creating a growing spectrum of long-term investment opportunities.

The investment case for sustainable infrastructure

As the backbone of the modern economy, all infrastructure must be consistent with the transition to a more sustainable economy. This realignment will create new opportunities for investors.

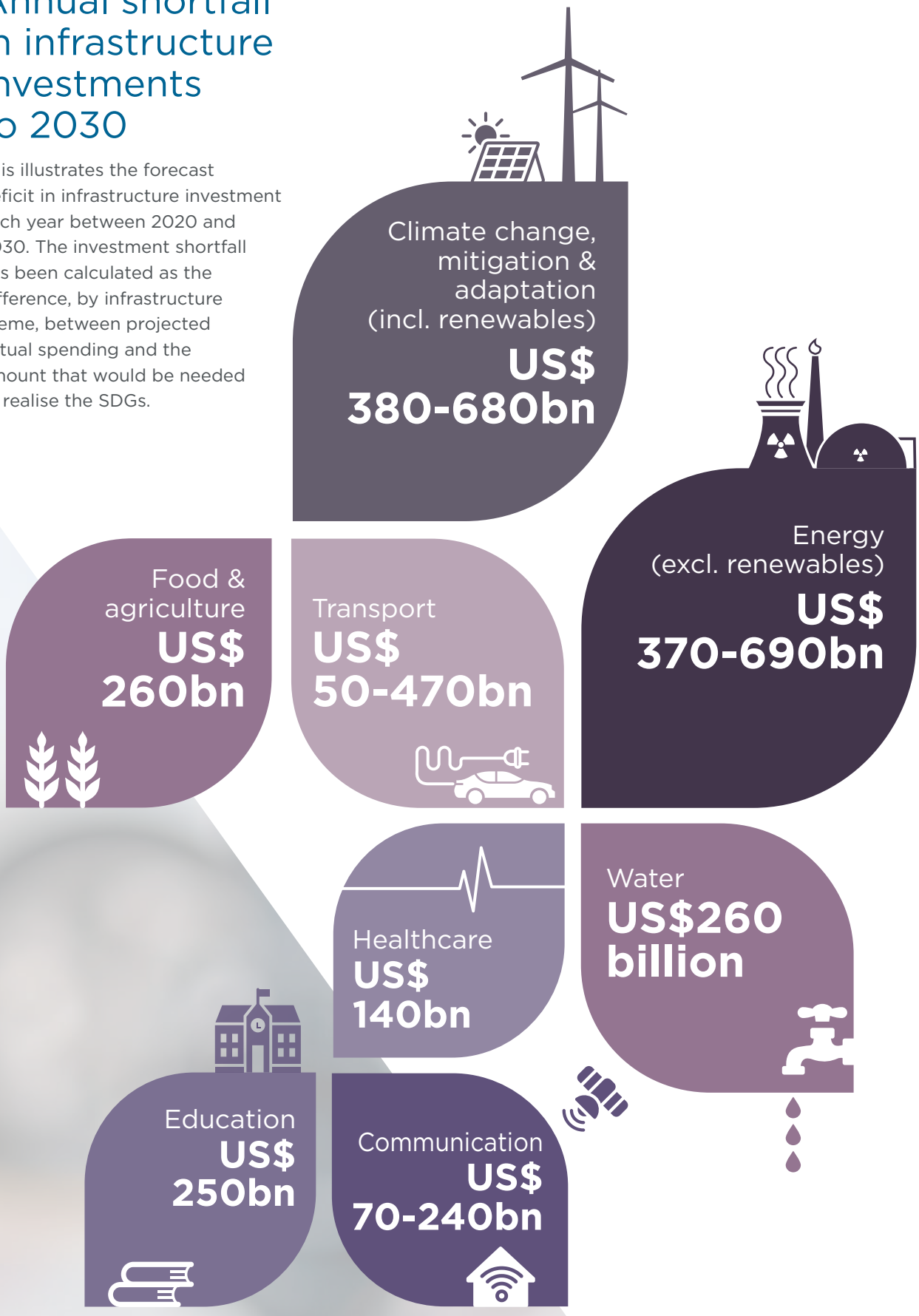
Definitions of what counts as infrastructure differ, as do estimates of the investment required over the coming years and decades. The G20-backed Global Infrastructure Hub estimated that infrastructure investments of US$97 trillion would be needed between 2016 and 2040, representing an increase from 3.0% to 3.7% of annual global GDP, to keep pace with development and demographic needs and meet the Sustainable Development Goals (SDGs).[2]

Many studies focus on the projected shortfall between forecast infrastructure investment and that required to sustain economic growth or realise global net zero. In a 2020 paper, the UN Conference on Trade and Development (UNCTAD) estimated the annual shortfall in infrastructure investments that would need to be bridged to realise the SDGs by their 2030 target (illustrated on page 5).[3]

2 Global Infrastructure Hub, 2018: Global Infrastructure Outlook: Infrastructure investment needs
3 UNCTAD, 2020: World Investment Report 2020: Investing in the SDGs

Annual shortfall in infrastructure investments to 2030

This illustrates the forecast deficit in infrastructure investment each year between 2020 and 2030. The investment shortfall has been calculated as the difference, by infrastructure theme, between projected actual spending and the amount that would be needed to realise the SDGs.



Source: UNCTAD estimates, 2020.

Three powerful, long-term forces drive the growing demand for investment in sustainable infrastructure

1

The need for **more infrastructure**

The world's population is forecast to reach 8.5 billion by 2030, up from 7.8 billion in 2020 and almost twice 1980 levels.[4] Almost all this growth will be in developing countries where birth rates are higher, and existing infrastructure stock is much lower. To meet the most basic needs of a growing population, investment in water and food infrastructure will be fundamental.

A dizzying array of new infrastructure is required to support the transition to a more sustainable economy and address persistent inequalities brought into sharp focus by the COVID-19 pandemic. This will not only provide tailwinds for companies delivering resource and economic infrastructure, such as renewable energy and public transport systems, but also new social infrastructure – including hospitals, schools and housing – to address increasing demand from rising and ageing populations.

New infrastructure will also accompany and enable technological changes. The pandemic has highlighted global society's dependence on digital technologies. Economic disruption would have been far greater without the assets and networks that underpin the digital economy we rely on to work, transact and communicate each day. As more of the world's population gains access to the internet, and as the rapid growth in data traffic, processing and storage continues, more data centres, fibre networks and mobile towers will be needed.

2

The need to **replace infrastructure**

The expanding global stock of infrastructure needs maintaining, upgrading and eventually replacing. While some assets have longer lifespans than others, all have limits on their useful life. Essential infrastructure built in the 20th century is ageing and increasingly unreliable for those who depend on it. The American Society of Civil Engineers graded US infrastructure as only "C–" in 2021. Deteriorating infrastructure is not only unreliable, but potentially hazardous: the collapse of Genoa's Morandi viaduct in 2018 killed 43 people.

The renewal and replacement of existing infrastructure assets is therefore a growing theme for governments, companies and investors. It also provides a valuable opportunity to align them with the transition to a more sustainable economy.

Much of today's infrastructure has to be upgraded or replaced for it to support the new economy. To enable the electric vehicle (EV) revolution, for instance, roads must be equipped with charging infrastructure. Millions of lead water pipes need replacing in the US alone.[5] Social infrastructure too must be upgraded to meet the needs of ageing, but more inclusive societies.

Infrastructure will also have to be replaced to adapt to the increasingly serious physical impacts of climate change. Coastal areas less than one metre above sea level were home to 267 million people in 2020 and will increasingly be at risk from tidal surges.[6] In New York City, which was

4 UN Department of Economic and Social Affairs, 2019: World Population Prospects
5 Environmental Protection Agency, 2018
6 Hooijer A. & Vernimmen R., 2021: Global LiDAR land elevation data reveal greatest sea-level rise vulnerability in the tropics, Nature Communications

inundated by Hurricane Sandy in 2012 causing US$19 billion of damage, the East Side Coastal Resiliency Project looks to make Manhattan more resilient to future storm surges by replacing infrastructure above ground and below it.

Meanwhile, thawing permafrost in the Arctic and on high-altitude plateaus threatens to damage buildings, roads and pipelines built on soil that is losing its capacity to bear weight. A recent study estimates that the annual cost of maintaining at-risk infrastructure in these regions could top US$35 billion.[7] In many cases it will be more cost-effective to replace than repair.

Dramatic events demonstrate how vulnerable infrastructure can be to physical climate risks, not least electricity networks. In California, faulty transmission equipment was found to have caused a 2018 wildfire that killed 84 people, and resulted in utility company PG&E declaring bankruptcy. The megadrought gripping the US West not only heightens wildfire risks but also undermines the region's ability to generate hydroelectric power, contributing to rolling brownouts in California.

7 Hjort J., Streletskiy D., Doré G., Wu Q., Bjella K. & Luoto M., 2022: Impacts of permafrost degradation on infrastructure, Nature Reviews Earth & Environment

3

The need to **substitute infrastructure**

Where infrastructure assets are incompatible with the transition to a more sustainable economy, or vulnerable to transition risks arising from climate change mitigation, alternatives must be found.

Infrastructure underpinning the old economy, characterised by pollution, ecological harm and waste, will become increasingly obsolete as regulations and taxes combine to put more pressure on actors to take environmental action. The International Renewable Energy Agency (IRENA) has estimated that more than US$600 billion in coal power infrastructure assets will be 'stranded' by 2050, given the critical role that decarbonising the power sector will play in meeting national climate targets.[8]

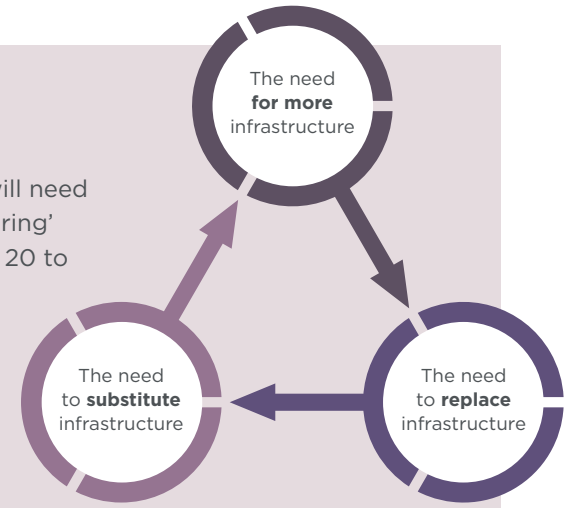
Technological change will also render certain types of infrastructure obsolete, much as the ubiquity of mobile phones has undermined the business case for landline telephone networks. Digital infrastructure will be especially vulnerable to obsolescence given the rapid pace of innovation and the efficiency gains that the latest software can deliver.

Critically, the new landscape of physical and transition climate risks dictates that infrastructure be much more resilient. In areas prone to wildfires, for instance, more decentralised renewable electricity generation can substitute or supplement electric grids, thereby reducing the risks associated with high-voltage transmission.

Water infrastructure too must adapt to changing precipitation patterns. We need look no further than South Africa, where reservoirs recently hit historically low levels, and the arid US West where the Colorado River basin struggles to supply the combined (and often competing) needs of 40 million residents and local agriculture. Drought solutions include infrastructure that reduces water leakage and evaporation, reuses more treated wastewater and captures storm runoff. In coastal areas, sustainably powered desalinisation plants that avoid impinging on marine life can be part of the solution.

'Repowering' renewable assets

Even relatively recent additions to our infrastructure stock will need to be upgraded. There is a significant trend towards 'repowering' wind farms whose turbines are approaching the end of their 20 to 25-year lifespans. According to WindEurope, some 10GW of onshore wind capacity in Europe was at least two decades old by 2020, with a further 26GW at least 15 years' old.[9]



Improvements in technology over the past two decades – namely bigger blades and taller towers – make it attractive to replace old turbines with larger versions that can generate more zero-carbon electricity.

There are several reasons to repower existing wind farms, rather than decommission them. The first is that the connecting infrastructure is already in place. The second is that the local community will be used to the visual impact of turbines. Another important factor is that early wind farms were logically located in prime locations. A study found that newer wind farms have increasingly been built in less windy locations since many of the best-suited locations are taken.[10]

8 IRENA, 2017: Stranded assets and renewables
9 Wind Europe, 2020: Decommissioning of Onshore Wind Turbines
10 F. Haces-Fernandez, 2021: Higher Wind: Highlighted Expansion Opportunities to Repower Wind Energy

Investment in sustainable infrastructure is catalysed today by...

Government policy

Particularly in developed economies, governments have adopted muscular responses to the twin challenge of COVID-19 and climate change. In response to the former, fiscal spending was ramped up to protect jobs and avoid a protracted recession.

Growing recognition of the urgent need for climate action was meanwhile reflected at the COP26 climate summit in 2021. Despite the gap between current national targets and the 1.5°C Paris temperature goal, important pledges were made by key actors. Ambitions to lay the foundations for a sustainable recovery and get national economies on track towards net zero are reflected in the fiscal strategies of several major markets.

One-third of the combined €1.8 trillion from the NextGenerationEU package of loans and grants and the EU's seven-year budget will finance the European Green Deal, whose focus includes cleaner energy, greener mobility and more energy-efficient buildings. Meanwhile the US$1.2 trillion INVEST in America Act includes over US$200 billion respectively for new and upgraded mass transit and rail infrastructure and for making buildings more energy efficient. Proposed legislation aims to go further and, if passed by Congress, could unlock hundreds of billions of dollars for clean energy and social infrastructure.

Geopolitical concerns, heightened by the Russian invasion of Ukraine in early 2022, have also sharpened minds on how to improve the security of energy supplies. Accelerating renewable energy generation is seen as fundamental to reducing European dependence on imported gas and oil.

Well-directed public investment in infrastructure can more than pay for itself over the long run due to the 'multiplier effect', whereby an increase in fiscal spending has a positive economic impact greater than the amount spent. A meta-analysis of research undertaken by the Global Infrastructure Hub found an average fiscal multiplier of around 1.5 within 2 to 5 years.[11] The multiplier effect is greater over longer time periods since infrastructure contributes supply-side capacity that can enhance future economic growth.

Corporate and consumer demand

A second tailwind is growing demand from the corporate sector and from wider society for more resilient, sustainable infrastructure. Growing momentum on climate action was demonstrated at COP26. More than 1,000 companies representing over US$23 trillion in market capitalisation joined the Business Ambition for 1.5°C campaign, with half committed to reaching net-zero emissions using the Science Based Targets Initiative's framework by 2050.[12]

Already, there is rising uptake of corporate power purchase agreements (CPPAs) under which companies buy renewable electricity directly from producers. Global CPPA volumes rose by nearly 24% in 2021 to 31.1GW, according to BloombergNEF, driven in part by technology companies securing green energy for data centres. Amazon, Microsoft and Meta were the three largest corporate buyers of clean energy in 2021.[13]

Meanwhile, consumer trends are fuelling demand for sustainable infrastructure. Take the rapidly growing market for EVs, for instance: the IEA estimates that 40 million public EV-charging points will be needed by 2030, up from only around 1 million in 2021. Rolling out road-charging infrastructure is expected to require investment of almost US$90 billion a year by the end of this decade.[14]

11 Global Infrastructure Hub, 2020: Fiscal multiplier effect of infrastructure investment
12 Science Based Targets Initiative, 2021: Business Ambition for 1.5C, Responding to the Climate Crisis
13 Bloomberg NEF, 2022: Corporate Clean Energy Buying Tops 30GW Mark in Record Year
14 IEA, 2021: Net Zero by 2050

Private markets:
Investing in renewable energy

Impax is one of the longest established private markets managers in the large and rapidly growing renewable energy infrastructure sector.

We believe in the potential to create value through private investment in European renewable energy projects that are in the late-stage development or construction stage. One such investment has been a portfolio of French PV solar and onshore wind assets which were acquired by Impax at the end of 2018, together with a team of local developers.[15]

Within the renewables market, we do not compete on scale of projects, but rather on the quality of opportunities where value can be added. Using our capital and expertise, we help take new projects into and through construction, and ultimately add new renewable energy capacity to the grid. This can be understood as the additionality of new clean energy projects to the European energy system.

Managing biodiversity risks and delivering impact

As well as managing construction and operational services, our local teams are responsible for ensuring stringent environmental impact assessment procedures are followed. Measures to mitigate biodiversity risks in this portfolio of solar and wind developments have included pausing construction during periods sensitive to wildlife, landscape works to provide reptile habitats, and the cultivation of bird habitat areas.

Our team has also actively encouraged community involvement. As part of a solar project in eastern France, we provided local access to a wooded area adjacent to the site. We also consider visual mitigation such as planting native hedgerows.

To demonstrate the environmental impact of our investments, we calculate the amount of CO_2 avoided by the portfolio of solar and wind assets when compared with the CO_2 emitted by the national electricity grid. **Once this portfolio of assets in France is fully constructed, it is expected to avoid over 5,400 tonnes of CO_2 emissions per annum[16] – equivalent to the emissions of 7,393 European households' annual electricity consumption[17].**

15 Impax acquired the EuroCape renewables development team in a separate, but simultaneous transaction
16 Impax calculations based on estimated net production and historic IEA emission factors, and solar and wind emissions factors from estimates provided by the IPCC, using the median lifecycle emissions as per the Impact @ Impax Report 2021
17 Impax calculations based on grid emission factors for the EU (Source: IEA, 2020) and average annual household electricity usage in the UK as a proxy for the EU (BEIS, 2020)

Impax is one of the longest established private markets managers in the large and rapidly growing renewable energy infrastructure sector.

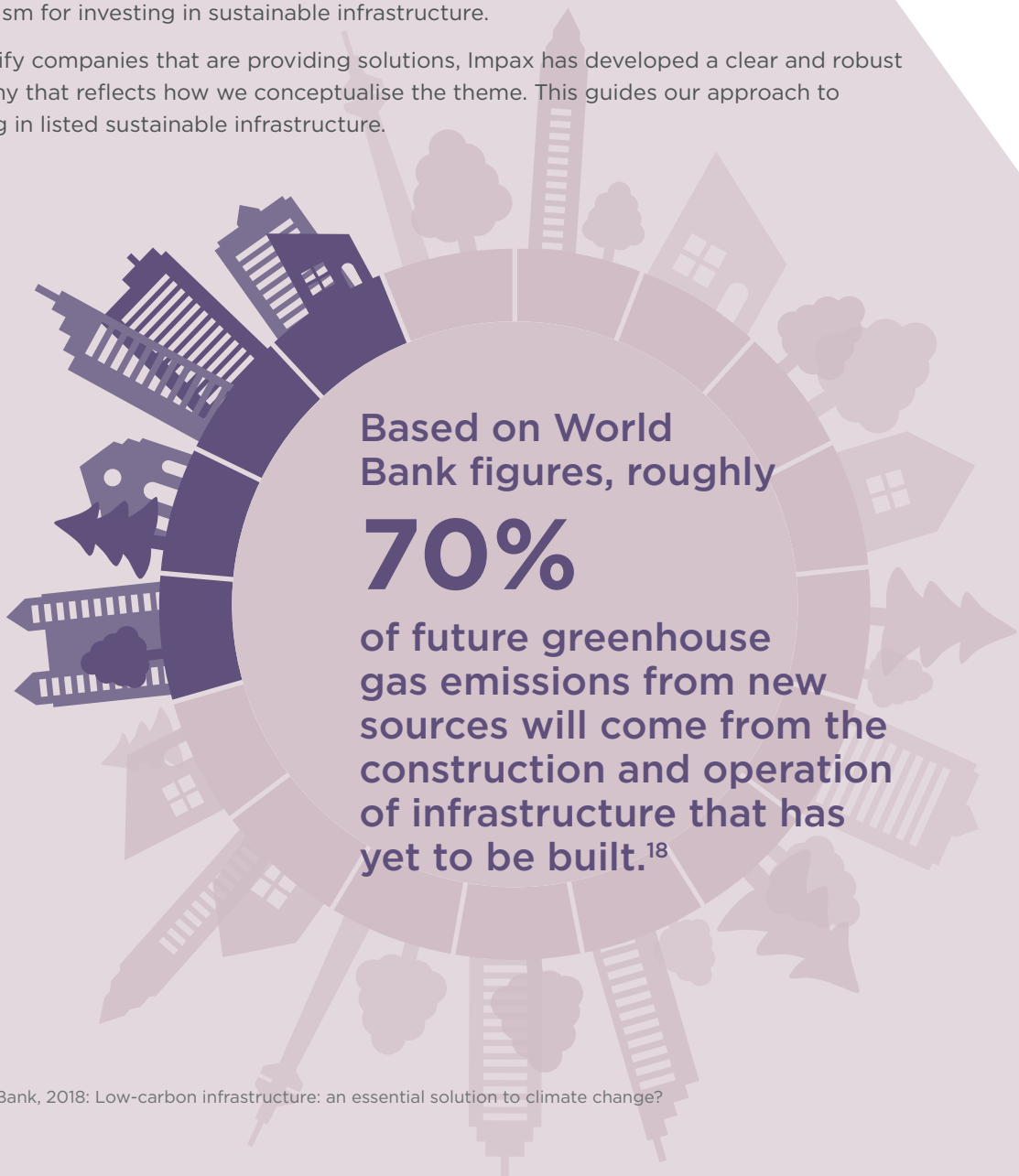
Investment opportunities in sustainable infrastructure

As investors focused on the transition to a more sustainable economy, we perceive a range of opportunities emerging as demand for sustainable infrastructure grows.

Opportunities are being created across a spectrum of areas, from the new energy infrastructure enabling the decarbonisation of the global economy to the digital infrastructure enabling more resilient and inclusive economic models.

Over the past couple of decades, the opportunity set in listed equities has broadened such that the asset class is now recognised – alongside debt and private markets – as a viable mechanism for investing in sustainable infrastructure.

To identify companies that are providing solutions, Impax has developed a clear and robust taxonomy that reflects how we conceptualise the theme. This guides our approach to investing in listed sustainable infrastructure.



Based on World Bank figures, roughly

70%

of future greenhouse gas emissions from new sources will come from the construction and operation of infrastructure that has yet to be built.[18]

18 World Bank, 2018: Low-carbon infrastructure: an essential solution to climate change?

Impax Sustainable Infrastructure Taxonomy

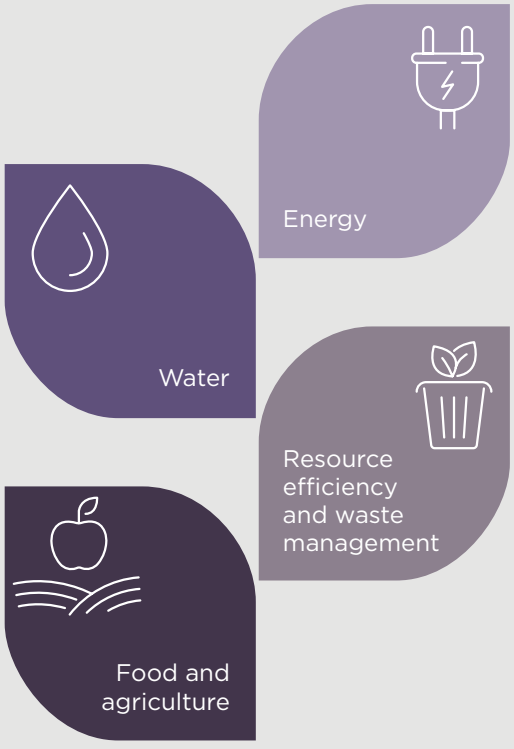
Our taxonomy provides the foundation to construct diversified portfolios that are representative of infrastructure essential for the transition to a more sustainable economy, while retaining the broad characteristics that investors expect from an infrastructure strategy.

Impax has pioneered the development of environmental market taxonomies over the past two decades.

We classify sustainable infrastructure into two broad categories

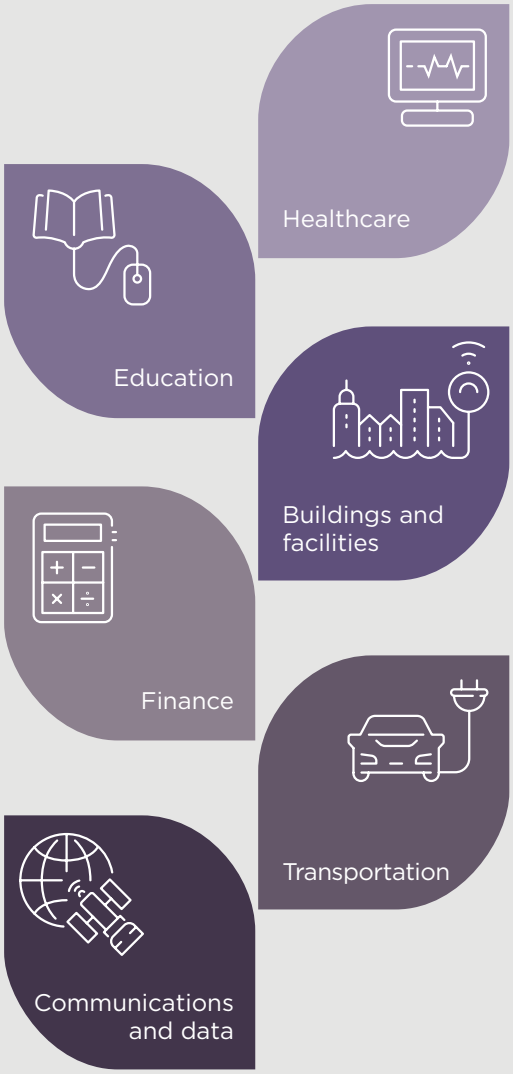
Resource infrastructure

Those assets, networks and systems that underpin the sustainable supply of life's vital ingredients – energy, food and water – as well as the repurposing of our waste.



Social and economic infrastructure

Those assets, networks and systems that underpin the delivery of essential services – education and healthcare – or enable the movement of people and goods as well as information and finance in the modern economy.



After categorisation, we lay out the broad areas of the economy within each of these two groups.

The focus is then narrowed to sub-sectors to identify companies that could be considered for inclusion in the portfolio.

We leverage in-house expertise and proprietary methodologies to determine the sustainability and infrastructure credentials of individual stocks. With no single metric to identify sustainable infrastructure companies, we have drawn on our experience in both thematic universe construction and the Impax Lens to calculate the taxonomy-related exposure of stocks. Companies must generate at least 20% of their revenues from infrastructure-related activities.

In turn, we now outline how we conceptualise each of the sectors that comprise our Impax Sustainable Infrastructure Taxonomy, and where we perceive long-term opportunities as part of the transition to a more sustainable economy.

Resource infrastructure

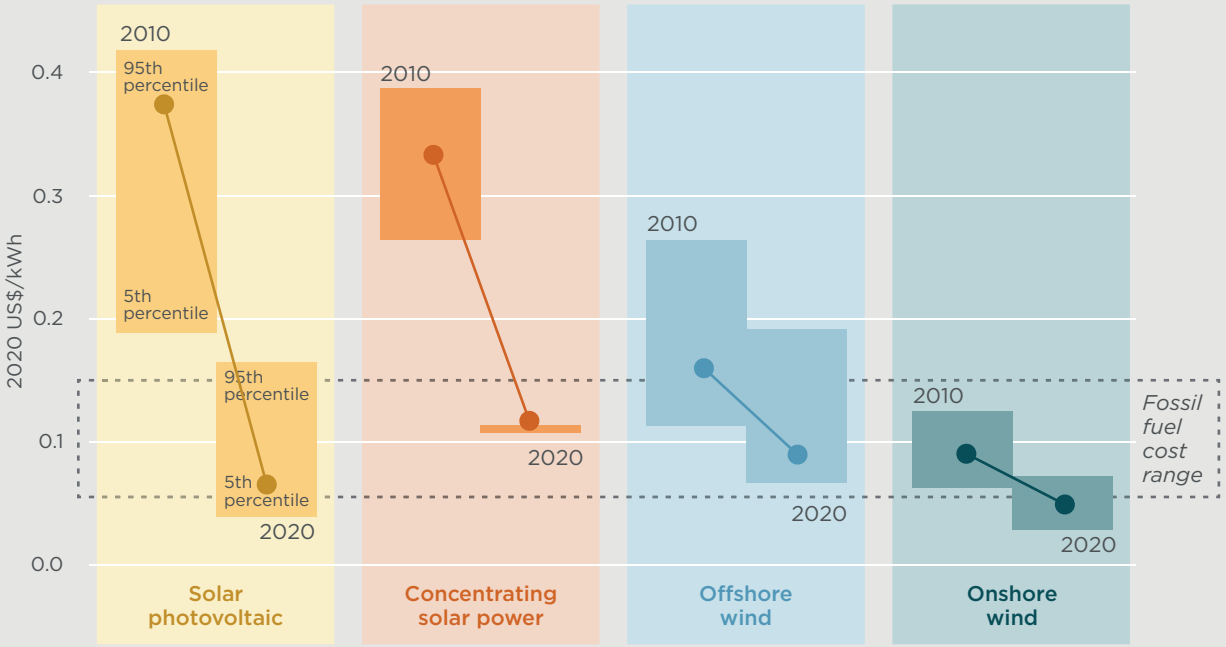
Energy

The transition to sustainable energy infrastructure is where the greatest investment is needed this decade. Today's energy sector is the largest contributor to global emissions, with electricity and heat production accounting for roughly 35% of the world's total.[19] Coal, the most polluting fossil fuel, remained 35% of the global electricity generation mix in 2020.[20]

There is little room for fossil fuel generation in any future that addresses the drivers of climate change. To align with the IEA's 2050 net-zero scenario, global electricity production must be net zero by 2040. The IEA model assumes that almost 70% is generated from solar and wind by 2050.[21] Encouragingly, renewables' share of the mix rose to 29% in 2020.[22]

Falling costs of renewable generation

Global weighted-average levelised costs of electricity generation from new large-scale projects, 2010 vs 2020



Source: IRENA Renewable Cost Database.

Note: This data is for the year of commissioning. The dots represent the global weighted-average LCOE value derived from the individual plants commissioned in the year. The project-level LCOE is calculated with a real weighted average cost of capital (WACC) of 7.5% for OECD countries and China in 2010, declining to 5% in 2020; and 10% in 2010 for the rest of the world, declining to 7.5% in 2020. The single band represents the fossil fuel-fired power generation cost range, while bands for each technology and year represent the 5th and 95th percentile bands for renewable projects.

19 United Nations, 2022
20 IEA, 2021: Global Energy Review: CO2 Emissions in 2020
21 IEA, 2021: World Energy Model, Net Zero Emissions by 2050 assumptions
22 IEA, 2021: Global Energy Review 2021

Advances in renewable technologies have enabled the costs of green electricity to tumble. According to IRENA, the prices of solar PV modules and wind turbines have respectively fallen by around 90% and 55% to 60% since 2010.[23] Today, solar and wind generation are not only competitive on price with fossil fuel alternatives, but are in some cases cheaper. IRENA has demonstrated how the operating costs of coal-fired plants in Europe are higher than new solar PV and onshore wind capacity.

Alongside falling costs, renewables' sustained growth – global generation rose by 8% in 2021 – has been fuelled by priority access to grids, long-term purchase agreements and accelerating installation of new assets.[24]

Companies involved in the development and operation of renewable power generation stand to play an integral role in decarbonising the grid at a time when the electrification of the modern economy is expected to drive enormous demand growth. Electricity will play a major role in decarbonising personal mobility (through the adoption of EVs), heating buildings (by replacing boilers with heat pumps) and in industrial processes, including the production of future fuels like hydrogen through energy-intensive electrolysis.

This structural growth prompts us to also focus on renewable energy equipment, such as gearboxes and blades for wind turbines, and technologies that help harness the power of solar radiation, including components like wafers, cells and modules.

Future electricity demand is not only a function of the number of global devices and processes powered by electricity, but also of how efficient they are. Maximising the efficiency of power networks can therefore significantly curtail energy demand growth, and so potentially enable the grid to go greener, sooner.

As well as looking at companies that design, develop or install equipment that makes power generation, transmission and distribution more efficient, we also look at those whose technologies enable the development of a smart grid. Among these, we expect those focused on products and facilities that store energy at either a grid or building level – including batteries and their components – and those focused on efficient backup power and uninterruptable power supply, to play increasingly prominent roles in new energy infrastructure.

Opportunities for a more efficient grid lie in expanding and digitising electricity networks to facilitate a two-way flow of energy and information between suppliers and users.

To achieve global net-zero emissions by 2050, the IEA estimates that global energy intensity must improve by 4% a year.

23 IRENA, 2021: Renewable Power Generation Costs in 2020
24 IEA, 2021: Global Energy Review 2021

Company in focus: Hubbell

The 'electrification of everything' will be a defining feature of the coming decades. The Energy Transition Commission has forecast that global electricity use will need to soar from 27,000 TWh in 2019 to between 90,000 and 130,000 TWh by 2050, if we are to decarbonise the economy.[25]

To maintain resilience in the face of rising demand, the IEA has estimated that annual global investment in new and upgraded transmission and distribution grids must more than treble from US$260 billion in 2020 to US$820 billion by 2030.[26]

Hubbell, whose products form part of the backbone of our electrical infrastructure, is one company at the centre of the trend towards efficient smart grids built on more flexible demand and more decentralised and intermittent supply from renewables.

The US company, which patented the pull chain lamp socket in 1896, today makes products ranging from critical components for high-voltage electricity transmission infrastructure to controls that increase the energy efficiency of homes. Hubbell's solutions also include smart metering devices and sensors, and communications systems that enable electricity and data to flow back and forth between utilities and electricity users. Together with its data collection and analysis services, the company provides the tools needed for smart grids.

Embedding cloud-enabled monitoring systems across electricity networks is a key ingredient for smarter grids capable of more efficiently matching demand with supply. Data from these components can be used to predict demand, plan supply and respond dynamically to network conditions. In so doing, they can help both reduce surplus energy supply and smooth demand when grids are strained – a process called 'peak shaving'.

Upgrading electricity infrastructure with smart, connected solutions has the potential to drive vast efficiency gains.

To achieve global net-zero emissions by 2050, the IEA estimates that global energy intensity must improve by 4% a year.[27]

The replacement of ageing grid and meter infrastructure with digitally enabled components will be instrumental to decarbonising electricity systems in way that keeps the lights on as we pursue net zero.

25 Energy Transition Commission, 2021: Making Clean Electrification Possible: 30 Years to Electrify the Global Economy
26 IEA, 2021: Net Zero by 2050
27 WEF, 2022: Energy efficiency is the world's 'first fuel' - and the main route to net zero, says IEA chief

Company in focus: Severn Trent

To address water scarcity and adapt to water stress and changing weather patterns, global annual investment in new and upgraded water and sanitation infrastructure will need to rise to as much as US$1.5 trillion by 2030.[28]

It is not only arid countries or those with rapidly growing populations where vast investment is required to improve water resilience. The UK's National Infrastructure Commission, for example, has warned that without action there is "roughly a 1 in 4 chance over the next 30 years that large numbers of households will have their water supply cut off... because of a severe drought".[29]

The UK's water utility companies have been encouraged to invest more in upgrading ageing infrastructure to improve clean water and sewerage systems, and to reduce leakage from pipes. **One of the largest, Severn Trent, provides regulated water and sewerage services to around 4.6 million UK households and businesses, delivering 2.0 billion litres of drinking water and treating 3.1 billion litres of wastewater each day.**

The utility is investing £1.7 billion between 2020 and 2025 to enhance its infrastructure, on top of £4.9 billion to maintain it.[30] By 2025, it is committed to cutting leaks by 15% and to reducing pollution incidents, which have fallen by 57% across its 92,000 km network of sewers over the past decade.[31] Further, the company was the largest beneficiary of the UK Green Recovery Fund given its proactive work on innovative infrastructure investment. The company is investing this £565 million in projects including the installation of 157,000 smart water meters across the Midlands.

Nature-based water management

Severn Trent is increasingly looking to nature-based water management solutions as a cost-effective alternative to concrete engineering systems that can also enhance biodiversity and capture carbon.

In 2020, the company planted almost 300,000 trees across its catchment area. It is also working with farmers to install phosphate-reducing interventions like wetlands and hedgerows – **it estimates that every £1 spent on reducing agricultural run-off avoids up to £20 of treatment costs and generates £4 of environmental benefits**.

28 OECD, 2017: Technical note on estimates of infrastructure investment needs, background note to the report, Investing in Climate, Investing in Growth
29 National Infrastructure Commission, 2018: Preparing for a drier future: England's water infrastructure needs
30 Severn Trent, 2019: PR19 Business Plan 2020-2025
31 Severn Trent, 2021: Sustainability Report 2021

Water

The availability of water is critically important to communities and industry, being essential to making everything from semiconductors to pharmaceuticals. Yet water is very unevenly distributed around the world, with patterns of rainfall and water availability being increasingly disrupted and amplified by the effects of climate change, including drought, floods, extreme rainfall and rising sea levels. According to the UN, two billion people lacked access to safely managed drinking water in 2020, owing either to quantity or quality issues.[32]

Perhaps the most visible elements of sustainable water infrastructure are the utility companies that households and businesses rely upon to provide, treat, and dispose of their water. They operate water treatment and supply infrastructure, and provide potable water or wastewater and sewage services.

The treatment process also involves companies that design, manufacture, and install technologies or facilities for the separation and purification of water. Technologies including membranes, ultra-violet, desalination, filtration, ion exchange, and biological treatment hold great potential in improving water quality.

Companies that supply products integral to moving water around economies, like specialty pipes, pumps, valves, actuators, hydrants and meters, are also core elements of water infrastructure. This also includes companies engaged in the development and construction of water distribution and infrastructure systems, and in coastal defence projects (which the World Bank estimates could amount to US$18.3 trillion this century, as sea levels rise).[33]

Digitalisation and the use of smart data is rapidly increasing in the water sector. There is growing adoption of smart monitoring technology to check water quality, to identify and tackle faults before they happen, and to pinpoint leaky pipes. Almost 3 billion litres of treated water are lost each day from leaks in England and Wales alone.[34] Plugging holes in global water networks can go a long way to mitigate the need for more costly water infrastructure, like new reservoirs or long-distance water transferral.

32 UN Department of Economic and Social Affairs, 2022: Sustainable Development Goal 6
33 World Bank, 2019: Global Investment Costs for Coastal Defense through the 21st Century
34 Water UK, 2020

Resource efficiency and waste management

Adopting the principles of a circular economic model, based on eliminating waste and maximising reuse and recycling, could address almost one-fifth of global emissions, according to the Ellen MacArthur Foundation.[35] Circular models of consumption and production also help tackle the root causes of biodiversity loss and the depletion of limited resources.

Key to the shift away from a wasteful linear economic model is a focus on resource efficiency. We believe companies that enable the re-use and rental of products, as part of a broader shift towards the sharing economy, are a core part of the infrastructure underpinning a sustainable economic model. Leasing out the likes of construction equipment maximises utilisation rates and ensures it is well maintained, and so more efficient, thereby improving resource efficiency.

Safely and efficiently collecting, processing and disposing of household and commercial waste is an essential part of basic sanitation. Companies with general waste management operations will remain integral to sustainable waste infrastructure, alongside those involved in the processing and treatment of hazardous waste. Opportunities in the latter are expected to rise as rising volumes of electronic waste and batteries, including from EVs, require environmentally sensitive management.

The global market for recycled metal, which is often cheaper than primary production, must also continue to grow if industries like steelmaking are to lower their environmental impact. The global market for scrap metal recycling has been estimated at US$280 billion a year.[36] Aggregates, oils, paper and plastics can all be recycled too. McKinsey has calculated that the plastics industry could generate up to US$60 billion by 2030 if global recycling and reuse rates quadrupled to 50%.[37]

The waste industry increasingly captures value using emerging technologies. By enabling greater efficiencies and recycling rates, companies that design and develop waste technology equipment – including sorters, reverse-vending machine, composters and anaerobic digesters – as well as systems and software that improve waste logistics, are part of the sustainable infrastructure ecosystem.

35 Ellen MacArthur Foundation, 2022
36 AMCS Group, 2019: The value of recycling metals
37 McKinsey & Company, 2018: Recycling and the future of the plastics industry

McKinsey has calculated that the plastics industry could generate up to US$60 billion by 2030 if global recycling and reuse rates quadrupled to 50%.

Food and agriculture

Developing a food system that can feed the world sustainably requires solutions that maximise agricultural output while minimising environmental harm, in the form of carbon emissions or ecosystem damage. We therefore believe companies whose solutions make farming efficient form a critical part of agricultural infrastructure, and could provide opportunities as the industry looks to meet growing global demand for food while aligning with national net-zero targets.

Companies that design, develop or make equipment like self-propelled machinery, such as tractors and harvesters, as well as equipment used in cultivation, planting, application and irrigation, can advance the efficiency of farming. Reducing post-harvest losses is vital too: it is estimated that more than 15% of food produced doesn't leave farms.[38] Technologies focused on grain handling, conditioning and storage can all cut waste.

A sustainable global food system also relies on resilient infrastructure that can reduce waste through more efficient and secure supply chains.

We believe companies engaged in the safe and efficient transporting, storing and handling of agricultural goods, as well as those that provide services that enhance the efficiency of food distribution, play integral roles here. Opportunities in the latter include technological innovation in the areas of food service distribution and online food retail, where efficiencies can be achieved through forecasting, procurement and inventory management optimisation, better delivery routing and fleet management.

Companies that enable better access to healthy nutrition, including operators of wholesale and retail distribution networks that focus on providing higher quality, fresh, natural or organic foods and beverages, are also important ingredients for sustainable food infrastructure.

38 WWF, 2021: Driven to Waste: The Global Impact of Food Loss on Farms

Social and economic

Healthcare

Global healthcare spending doubled in real terms between 2000 and 2019, when its share of global GDP stood at 9.8%.[39] Government spending in response to the COVID-19 pandemic has pushed this up further. Yet it is estimated that half of the world's population lacks access to essential health services.[40]

The combination of larger post-COVID public spending deficits and ageing populations means there is a greater need for solutions that can make healthcare more efficient while widening access. We believe this creates long-term opportunities for companies whose products and services form part of a sustainable and inclusive global healthcare infrastructure.

The likes of hospitals, nursing facilities and residential care homes – and the companies that own them – are integral elements of healthcare infrastructure, but we also look beyond the facilities in which treatment or care is delivered.

Modern healthcare infrastructure relies upon reliable and efficient logistics. Pharmacies and networks that distribute pharmaceutical products and medical devices play a key role in a complex supply chain where timeliness and resilience can save lives. Companies that provide laboratory capacity and diagnostics, as well as those in the healthcare manufacturing supply chain, are also key pillars of healthcare infrastructure.

Additionally, we look at companies that provide the digital infrastructure that healthcare systems increasingly rely upon. This includes payment and reimbursement systems as well as virtual visitation software.

Education

Working towards universal access to quality education is essential to improving equality of opportunity, and so is a foundation for sustainable development. Yet quality secondary and tertiary education, in particular, remains inaccessible to millions often based on geography or gender. Technological innovation has the potential to address this inequality while creating opportunities for investors.

Educational infrastructure, like healthcare, goes beyond bricks and mortar in the digital era. Digital technologies can facilitate more effective and democratic transferral of knowledge and skills, so long as the 'digital divide' can be bridged by providing those people not yet equipped with digital skills with the know-how to thrive in technology-led settings. This was demonstrated during the COVID-19 pandemic, when over 1.2 billion children were affected by school closures and education providers relied on technologies like video conferencing and online learning software to continue instruction.

The pandemic accelerated trends towards enhanced connectivity and online education technologies that now, post-pandemic, can enable new business models to flourish. Advanced virtual classroom technologies, for instance, mean many higher education providers will choose to switch to online or hybrid delivery models.

We believe there are opportunities to invest in companies that contribute to education networks, including those that provide educational technology tools and media that assist in the communication of knowledge, and its development and exchange, as well as those engaged in more traditional educational services like content and publishing.

39 World Health Organisation, 2021: Global expenditure on health: Public spending on the rise?
40 World Health Organization, 2017: World Bank/WHO UHC Global Monitoring Report

REITs: A cornerstone of modern healthcare and education

Physical buildings can play an essential role in meeting many of society's needs. The listed real estate investment trusts (REITs) that own such buildings themselves form part of modern social infrastructure. We believe REITs, including those focused on the healthcare and education sectors, can provide compelling investment opportunities aligned with the transition to a more sustainable economy.

Within healthcare, there are REITs focused on hospitals, office buildings and medical research parks. US company **Welltower** owns more than 1,500 properties leased to healthcare operators in the US, Canada and the UK. Most of its portfolio is dedicated to senior living communities, offering varying degrees of care and support, that are designed to meet the demands of a rapidly ageing population.

Within education, **American Campus Communities** illustrates how REITs can support the demands of society through inclusive student accommodation on or near university campuses. The US company owns and manages more than 160 dedicated student housing communities. As well as providing convenient accommodation for higher education students, often in areas where there is under-supply of housing, purpose-built properties can be constructed and maintained to high standards of environmental efficiency.

Buildings and facilities

The global urban population is forecast to rise from around 4.2 billion to 6.7 billion people by the middle of the century.[41] The built environment forms a major element of our social and economic infrastructure.

Buildings and facilities are key enablers of sustainable development by meeting the demands of a growing population. Given the imperative of safe shelter, access to affordable, quality housing is a political flashpoint in cities around the world. REITs that specialise in parts of the market, such as student housing or high-density apartment buildings, can address clear market needs.

Similarly, REITs that own and manage office real estate, from skyscrapers to office parks, or industrial buildings like warehouses and distribution centres can meet corporate and consumer demand during the transition to a more sustainable economy.

The operation of buildings accounts for 28% of global carbon emissions, once indirect emissions from power generation are factored in.[42] Maximising the energy efficiency of our built environmental is central to the IEA's 2050 net-zero scenario: by 2030, all new buildings should be zero-carbon ready and, by 2040, half of existing buildings should have been retrofitted to the same standards.[43]

Companies that design, manufacture or install products and services that advance energy efficiency are therefore key to the sustainable transition. These include companies focused on insulation materials, energy efficient lighting, efficient heating, ventilation and air-conditioning equipment, as well as integrated building control systems. We look too at companies whose products or components improve energy profiles, or reduce energy usage within industrial processes where even minor improvements can deliver vast impacts.

Finance

Having access to the right financial products enables people to better meet their basic needs, protect themselves in times of crisis, and to save and borrow for their futures. Technology is again the enabling force behind evolving financial infrastructure that can support the transition to a more sustainable and inclusive economy by delivering financial services to historically under-served communities, often in emerging markets.

Incremental access to finance increasingly leverages technology-based solutions, with payment processing networks sitting at the heart of global financial infrastructure. These networks facilitate the almost-seamless transferral of electronic funds throughout the world with ever-diminishing costs to end users. Hidden behind each is a complex network of payment rails that connect consumers, merchants, processors and banks. The companies that own and operate this financial infrastructure, which is difficult to replicate, are core enablers of the new economy.

Meanwhile, traditional financial services companies also have an enormous part to play. As gatekeepers to the finance and insurance needed for sustainable infrastructure projects to go ahead, they are key facilitators of the sustainable transition. If climate change is to be contained, for instance, estimates suggest annual financing of US$3 trillion to US$5 trillion is required between now and 2050.[44] This creates opportunities for banks, many of whom have often attracted scrutiny for their involvement in 'old economy' projects, in issuing loans and underwriting equity and bond issuance for those building new sustainable infrastructure.

41 UN Department of Economic and Social Affairs, 2018: World Urbanization Prospects
42 IEA, 2020: Tracking Buildings 2020
43 IEA, 2021: World Energy Model, Net Zero Emissions by 2050 assumptions
44 Boston Consulting Group & Global Financial Markets Association, 2020: Climate Finance Markets and the Real Economy

Company in focus:
Nemetschek Group

Software has become integral to the efficient design, construction and management of buildings. At the design stage, it enables architects and engineers to simulate the performance of buildings in real-world conditions. Using the power of computing to explore different design permutations including choice of materials, within parameters like space or costs, they can optimise the design of projects.

Systematic digitalisation can also speed up the construction phase, lowering costs and improving build quality. Given that around 30% of materials are wasted on site, the potential for resource efficiency gains is enormous when you consider that levels of digital adoption remain low in the construction industry – the construction industry in Europe has a digitalisation level of only 7%.[45]

Nemetschek is one of the leaders in this growing space. The German company, which developed its first software programme in 1977, provides software solutions that cover the entire life cycle of construction and infrastructure projects. Its solutions can save clients in both development costs and operational expenditure: smarter use of materials, including timber, and optimised design including the positioning of windows can maximise building efficiency.

By enabling better-designed, more efficient buildings that deliver environmental benefits from the day ground is broken on projects, throughout their operational lives, Nemetschek's software plays a galvanising role in the transition to a more sustainable economy.

Saving money and energy

Integration of Nemetschek's workplace management systems software can enable better management of heating, lighting and ventilation in offices and public buildings. Data analysis and performance simulation creates a feedback loop that can continually improve building efficiency.

Nemetschek's smart building software solutions have cut Flemish government buildings' energy use by half, according to the company.

45 Nemetschek, 2021: CSR Report 2020

Alongside the EV transition, enhanced rail infrastructure is crucial to addressing climate change, improving air quality and widening access to economic opportunity.

Transportation

Technological innovation and urbanisation are driving a shift away from transport infrastructure oriented around private ownership of cars powered by the internal combustion engine (ICE). The fossil fuel-intensive transport sector is a major contributor to climate change, accounting for 24% of global CO_2 emissions from fuel combustion.[46] Road vehicles account for nearly three-quarters of this.

Promisingly, improvements in battery technology and changing tastes are fuelling rapid growth in EV sales: it is forecast that global passenger EV sales will rise from 3.1 million in 2020 to 14 million by 2025. Policy shifts are another critical factor in setting the direction of travel. In 2021, more than 100 countries pledged to end the sale of ICE cars and vans by 2040 or earlier, and by 2035 in developed markets.

We believe there are growing opportunities for companies involved in the design, development or manufacturing of solutions and technologies for autonomous and EV infrastructure. This includes vehicle-to-infrastructure communication, connecting vehicles to traffic signals and variable speed limits so they can respond autonomously; vehicle-to-vehicle communication, enabling vehicles sharing a road space to exchange data on their location, direction and speed; and vehicle-to-network communication, connecting passenger devices to digital infrastructure so journey times can be spent more productively.

Alongside the EV transition, enhanced rail infrastructure is crucial to addressing climate change, improving air quality and widening access to economic opportunity. Analysis by the International Transport Forum found that urban trains are roughly half as polluting than private EVs, per passenger kilometre, over their life cycles. The same is true for freight: transporting goods by rail can reduce carbon emissions by 76% compared to by road.[47]

The World Bank estimates that a full transition to sustainable mobility could deliver savings of US$70 trillion by 2050, once vehicle and fuel costs, as well as losses due to congestion, are factored in.[48] After a decade of public underinvestment in public transport outside of China, it features prominently in many major economies' pandemic recovery spending plans.[49] We believe companies involved in the design, construction and management of rail infrastructure, rolling stock and components, as well as operation of public transportation and rail freight networks, are at the centre of this infrastructure theme.

Over greater distances, aviation and shipping are critical to moving people and goods around the world efficiently, but account for 6% of global CO_2 emissions combined. Without decarbonising solutions, emissions in both sectors are forecast to rise by more than 80% by 2050.[50]

Aligning aviation and shipping, which are critical to global transport infrastructure, with net-zero goals will create opportunities for companies that design, develop or manufacture advanced aircraft, ships and components that enable improvements in fuel economy. Companies that develop future fuels – which could include hydrogen and ammonia – will catalyse the transition to sustainable aviation and shipping, as will operators and ports that play key roles alongside them.

46 IEA, 2020: Tracking Transport 2020
47 Office of Rail and Road, 2021: Rail Emissions 2020-21
48 World Bank, 2022
49 World Resources Institute, 2022: 3 Ways to Reimagine Public Transport for People and the Climate
50 Energy Transitions Commission, 2018: Mission Possible: Reaching Net-Zero Carbon Emissions from Harder-to-Abate Sectors by Mid-Century

Communications and data

If the critical importance of digital infrastructure needed underscoring, the COVID-19 pandemic emphasised just how reliant the modern economy is on the seamless flow of data. Global internet traffic rose by more than 40% in 2020.[51]

Without digital connectivity, global society would have been considerably less resilient during the lockdowns imposed to curtail the virus' spread. A study by the Inter-American Development Bank has estimated that telecommunications infrastructure saved Latin America and the Caribbean countries between 20% and 25% of GDP during periods of restricted movement.[52] In economies with better digital infrastructure and more office-based jobs that can be undertaken remotely, their impact will have been greater.

There are several layers to the digital infrastructure that securely and reliably connects us to data, information, colleagues and loved ones. Our most visible interaction is often with companies that run communication networks that form their backbone. These networks range from fixed phone lines and fibre-optic broadband cables that run door-to-door, to the masts and satellites that enable wireless mobile networks.

According to World Bank figures, 57% of the world's population had web access in 2019.[53] Billions access the internet through their mobile phones, which play a critical role in sustainable development by democratising access to basic services. The roll out of 5G networks, which can transfer data up to 16 times faster than 4G, is expected to enable continued rapid growth in mobile data traffic this decade.

Quicker connections enable more devices and machines to be digitally connected as part of the shift towards the Internet of Things. Technology company Cisco has forecast that machine-to-machine connections will rise from 6.1 billion in 2018 to 14.7 billion by 2023, driven by connected home appliances like white goods and by connected car applications, including vehicle diagnostics and navigation.[54]

The rapid rise in global data traffic demands greater capacity to process and store it. The world's accumulated digital data is forecast to have multiplied ten-fold from 4.4 zettabytes (one trillion gigabytes) in 2013 to 44 zettabytes in 2020.[55] This is a long-term demand driver for companies providing cloud and data centre services. While data centres consumed 1% of global electricity use in 2020 (excluding cryptocurrency mining), economies of scale mean they are highly energy efficient when compared to local data processing.[56]

Essential processes and services today also depend on software. An obvious area is software and systems that connect people and data in the era of remote working and digital collaboration. Software companies that make processes more efficient are critically important to the sustainable economy. Examples include enterprise resource planning software, which looks to optimise logistics, and product lifecycle management software, which looks to optimise operations.

Given the growing vulnerability of core services to disruption by cyber-attack, network security is also a vital and expanding part of digital infrastructure. The Center for Strategic and International Studies has estimated that almost US$600 billion is lost to cybercrime each year. Companies that provide protection of computer systems and networks from the theft of or damage to their hardware, software, or data, as well as from the disruption or misdirection of the services they provide, play an important role in protecting core infrastructure.

51 IEA, 2021: Data Centres and Data Transmission Networks
52 Inter-American Development Bank, 2020: The Impact of Digital Infrastructure on the Consequences of COVID-19 and on the Mitigation of Future Effects
53 World Bank, 2022
54 Cisco, 2020: Cisco Annual Internet Report (2018–2023) White Paper
55 Financial Times, 2021: Big Data: reasons to be anxious, Pt 3
56 IEA, 2021: Data Centres and Data Transmission Networks

Fixed income:
Investing in solar ABS

Impax has made investments in the relatively new, but fast-growing asset class of solar asset-backed securities (ABS). Each security is formed of either pooled loans, leases or power purchase agreements (PPAs) used to finance residential photovoltaic (PV) solar power generation systems. Repayments by homeowners form the cashflows used to pay coupons to solar ABS investors.

Under leases and PPAs, third parties continue to own the solar PV assets and households either lease them for a fixed regular sum or make payments based on electricity consumption. Consultants Wood Mackenzie estimated that the loan segment (now representing 60%) of the US residential solar market would grow by 40%, year-on-year, in 2021.[57]

The majority of Impax's solar ABS investments are backed by residential PV loans. Among those we have invested in include issuances by Sunnova Energy International, one of the largest solar PV providers across the US, which has issued solar ABS since 2017.

Environmental and social impact

We believe that solar ABS deliver an environmental benefit by catalysing adoption of solar power generation. By widening access to finance for residential PV systems, these securities ultimately enable households to generate electricity from a renewable source on their rooftops, reducing their dependence on polluting alternatives and improving energy security.

The typical solar ABS in the US finances around 7,700 loans to households. Based on the average size of a residential PV system in the US, **we have estimated that each security results in around 38.5 MW of renewable energy capacity.**[58]

57 Wood Mackenzie, 2021: Major financiers capitalise on a growing US residential solar market

58 Impax calculations based on the average size of a residential PV system - 5kW, according to the Solar Energy Industries Association (2021) - and the average number of loans in a security based on solar ABS issuances from 2017 to 2021 across the three main US issuers (Sunnova, Solar Mosaic and Goodleap)

Sustainable infrastructure in a portfolio

Sustainable infrastructure can **contribute to diversification**

Infrastructure has the demonstrable potential to act as an effective diversifier for long-term investors. Research has found that unlisted infrastructure assets have delivered returns that are uncorrelated with overall global equities and bond markets, not least during periods of market turmoil.[59, 60] This is consistent with private equity as an asset class, more broadly.

Among the distinguishing characteristics of infrastructure assets are their strong and reliable cash flows. A supporting factor here is the capital intensity of most infrastructure assets, which makes them difficult to replicate and so creates an economic moat around them. Meanwhile, the essential nature of infrastructure products and services to users means they cannot easily be substituted and so income streams are generally less sensitive to the economic cycle, providing greater predictability in both the short-term and long-term. Additionally, in many sectors at least, market structures confer pricing power that enables infrastructure revenues to keep pace with inflation. In some sectors, inflation-linked increases are enshrined in legislation.

While these characteristics can be enjoyed by infrastructure companies irrespective of whether their shares are listed or not, listed infrastructure stocks have not been found to confer the same degree of portfolio diversification. A 2016 analysis by the EDHEC Infrastructure Institute found no evidence of persistent diversification benefits conferred by listed infrastructure portfolios, compared to global equities overall.[61]

Yet **listed infrastructure can play a diversifying role within an allocation to equities.** Its relatively low volatility and high dividend yield, compared to the overall stockmarket, can offer defensive characteristics to equities portfolios. Comparing the FTSE Global Infrastructure Index with the FTSE All-World Index shows how listed infrastructure stocks have historically provided a measure of downside protection in challenging markets.[62]

Traditional listed infrastructure companies, including energy and water utilities, have been among the highest yielding stocks in developed economy stockmarkets. Dividend payments have comprised half of shareholder returns over the past 20 years, according to analysis by UBS.[63]

Our conviction is that sustainable infrastructure stocks have the same capacity to provide investors with resilient income streams that grow in real terms over the long-term. As we transition to a more sustainable economy, we expect the income-paying capacity of some old economy infrastructure sectors, such as oil pipelines, to dry up as their business models are misaligned with climate action. In their place will be the companies providing the infrastructure supporting the new economy.

59 Duclos C., 2019: Infrastructure Investment as a True Portfolio Diversifier, The Journal of Private Equity
60 Thierie W. & De Moor L., 2016: The characteristics of infrastructure as an investment class, Financial Markets and Portfolio Management
61 EDHEC Infrastructure Institute-Singapore, 2016: Searching for a Listed Infrastructure Asset Class
62 FTSE Infrastructure Index Series, 29 April 2022
63 UBS Asset Management, 2020: The case for global listed infrastructure

Sustainable infrastructure can **deliver long-term growth**

Infrastructure companies whose revenues are tied to carbon-intensive processes increasingly swim against the tide of climate action. The impetus to make progress towards global net zero, and to address broader environment challenges, undermines the long-term strength of their business models and renders their shares uninvestable to many investors.

In contrast, we believe companies whose products and services are aligned with the sustainable transition have much greater potential to grow their businesses over the decades ahead. Their growth will be abetted by the powerful tailwinds provided by climate action, including targeted stimulus by governments working towards net-zero goals and the evolving preferences of environmentally conscious consumers.

Urgency to broaden the foundations for sustainable and inclusive economic growth meanwhile supports the secular growth of areas like digital and healthcare infrastructure. Companies that can enable solutions to social and environment challenges should offer investors greater upside potential over the years ahead.

Sustainable infrastructure can help **mitigate portfolio climate risks**

Physical climate risks and transition risks pose a major threat to many existing infrastructure assets. Scenario analysis by the C40 cities network has estimated that 270 power plants worldwide are vulnerable to sea level rises of 50cm or more.[64] Acute physical climate risks come from the growing threats posed by storms, floods, heatwaves and wildfires.

Investors are also waking up to stranded asset risks. The transition to a more sustainable economy raises the chances that old economy infrastructure may become economically redundant, and so lose value, much sooner than expected.

By being more resilient to both physical and transition climate risks, as well as often being part of the solution to the climate emergency, sustainable infrastructure assets have the potential to offer much better protection from downside risks over the coming decades.

Sustainable infrastructure can **deliver impact**

Sustainable infrastructure can play an integral part in addressing the world's greatest challenges, both social and environmental. It connects people to opportunities and services and so underpins inclusive economic growth that enhances quality of life and reduces human impact on the natural world. Infrastructure assets can also directly benefit the communities where they reside, as well as wider society.

Companies focused on the development or delivery of sustainable infrastructure can therefore be understood to deliver an impact through their products or services. We can look to quantify the impact of their activities by considering relevant metrics, such as carbon emissions avoided, water saved, renewable energy generated or waste recycled. This impact can be mapped to the SDGs to indicate their level of alignment with this framework, which is used by many asset owners as a tool to evaluate their positive impact exposure.

By providing primary finance for new sustainable infrastructure, either through private markets investments in early-stage projects or through participating in new bond issuances, investors can also be understood to have an additional impact.

64 Urban Climate Change Research Network, 2018: The future we don't want

The transition to a more sustainable economy raises the chances that old economy infrastructure may become economically redundant, and so lose value, much sooner than expected.

Conclusion

Infrastructure provides the foundations for a more sustainable economy. The realignment of the global economy with an economic model that arrests environmental decline and promotes fairness and inclusivity creates huge demand for new and updated infrastructure. In turn, this creates opportunities for companies whose products and services can meet these evolving needs.

New infrastructure is needed to enable us to address the most pressing challenges facing global society, including climate change and ensuring access to basic needs. Existing infrastructure must become resilient to future threats posed by more extreme weather and rising sea levels, and in some cases repurposed to meet the requirements of a changing society.

Government spending and incentives focused on weaning societies off carbon-intensive processes provide tailwinds for companies that provide sustainable infrastructure, strengthened further by swelling ranks of sustainably minded consumers and businesses.

As outlined in this paper, we believe the transition to a more sustainable economy will be enabled by social and digital infrastructure as much as by traditional economic and resources infrastructure, like energy and transport. The breadth of the opportunity set is captured in our Impax Sustainable Infrastructure Taxonomy.

Investors today can access infrastructure through listed equities as well as through private markets and debt. As explained here, we believe that a portfolio of sustainable infrastructure stocks, ranging from renewable energy utilities to data centre operators, has the potential to offer resilient long-term growth and income, as well as diversification within allocations to equities. By virtue of their alignment with the transition to a more sustainable economy, these stocks should also help investors reduce their physical and transition climate risks.

In an exquisite symbiosis, the interests of investors are aligned with those of the planet and its people. We believe there are significant opportunities over the coming decades for those who align their investments with the sustainable infrastructure theme.

Contributors

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Sustainable infrastructure

Enabling the transition to the new economy

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