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Infrastructure as an investment for insurance companies and pension funds

17 October 2022

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Infrastructure Investment – an introductory guide

Chris Lewin, chairman of the Infrastructure Working Party

17 October 2022

Arrangements for today

- Speakers:
  - Hemal Naran, working party member
  - Monica Rossi, working party member
  - Peter Knott, UK Infrastructure Bank
  - Oliver Morency, EDHEC
  - Simon Whistler, PRI

- General discussion – use the “Q&A” function
- Any unanswered questions will be followed up afterwards

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Purpose of the Guide

- Written by the IFoA’s Infrastructure Working Party, based on members’ own experiences

- Covers many aspects of infrastructure investment for insurance companies and pension funds, including risks and returns

- Intended mainly for those who are new to the subject

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Contents of the guide

- History and background
- Types of infrastructure
- Ways investors can get exposure
- Performance benchmarks
- Risks of individual investments
- Social aspects, ESG and SDG
- Past performance
- Conclusions
- Bibliography for you to follow up

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Conclusions

- Need for a good spread
- More risk-management needed to analyse climate risks
- Re-rating of infrastructure around 2015 affects past performance results
- Asset performance has both infrastructure and financing components
- A need to understand the risks from the financing component
- Inclusion of infrastructure can make reported performance more stable

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Social Considerations

Social considerations are increasingly important for an investor's reputation:

> '…an [ESG] risk assessment determines the impact of the world on a portfolio or asset; whereas considering [SDG-related] outcomes should determine the impact of a portfolio or asset on the world' (PRI, 2020b, p.10)

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Why Infrastructure as an asset class?

Hemal Naran

17 October 2022

Why Infrastructure as an asset class?

- On paper, ideal institutional investment:
  - Long life assets (10 to 30 years)
  - Liability/duration matching
  - Somewhat predictable demand
  - Steady income stream (when operational)
  - Inflation linkage
  - Monopolistic asset
  - Capital intensive
  - High barriers to entry
  - Socially responsible investment

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Diverse Asset Class

	Economic infrastructure		Social infrastructure
Transport	**Utilities**	**Communications**	
Bridges	Gas networks	Fixed line networks	Education facilities
Toll roads	Electricity networks	Mobile masts	Healthcare facilities
Tunnels	Power generation	Satellite	Correctional facilities
Airports	Water and sewerage	Broadcast facilities	Housing
Sea ports	Renewable energy		Public transport
Rail			Government buildings
Ferries			Barracks
Trams			

- The above sectors vary considerably by degree of regulation, level of competition, and hence risk

Institutional Investors and Infrastructure

- Modern history of infrastructure investing got its start from the shift in the use public funds to provide infrastructure services/assets
- Led by Australian and Canadian pension funds in the 1990’s
- Broader acceptance in the early 2000’s as the search for diversification due to aggressive pricing of other asset classes
- Now its more about long term asset/liability and cash flow matching
- This has led to a number of new approaches to infrastructure investing – new models and fit-for-purpose T&Cs

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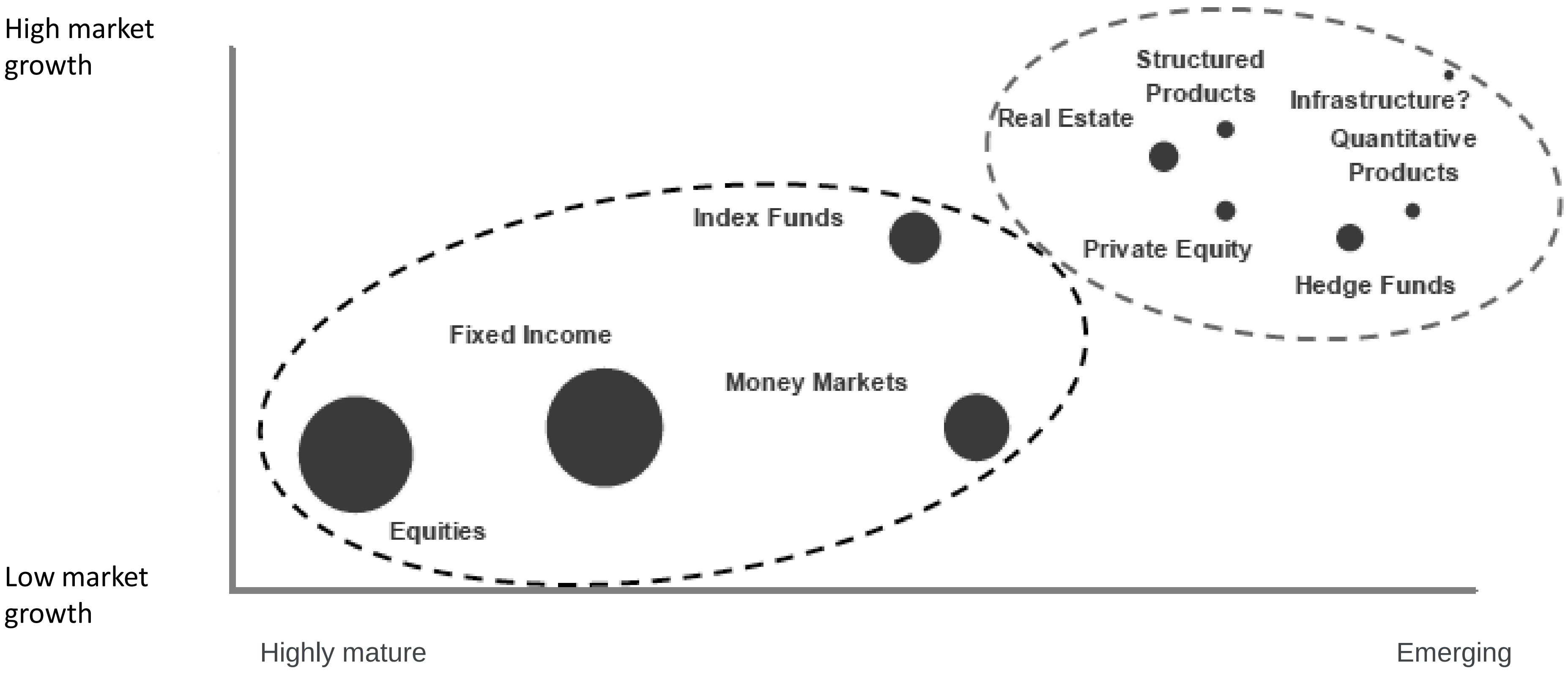
Emergence of Infrastructure (2005/2006)



Source: RREEF

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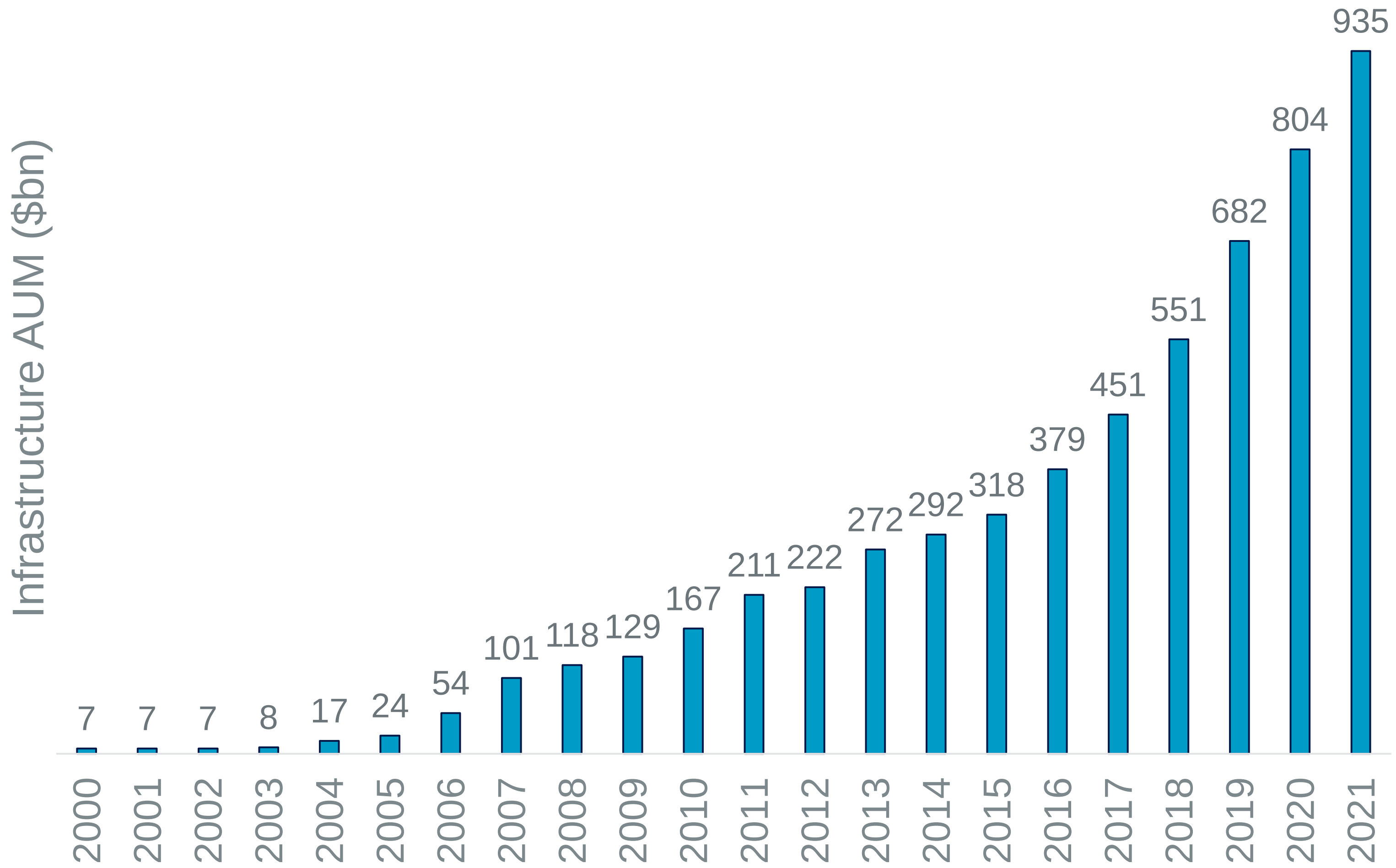
Unlisted Infrastructure AUM



Source: Preqin

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Established Asset Class

- Scale and pace of growth of infrastructure remains strong – record funding raising >$100 billion p.a. since 2017
- No longer emerging but certainly growing strongly
  - Length of time circa 15+ years
  - Performance data available and of decent quality
  - Strong academic research
- Range of progress – well regarded in Europe, North America and Australia
  - significant variations across other markets (LatAm, China, CEE, SE Asia and Africa)
  - To do with property rights, private ownership laws, value and volume of deals

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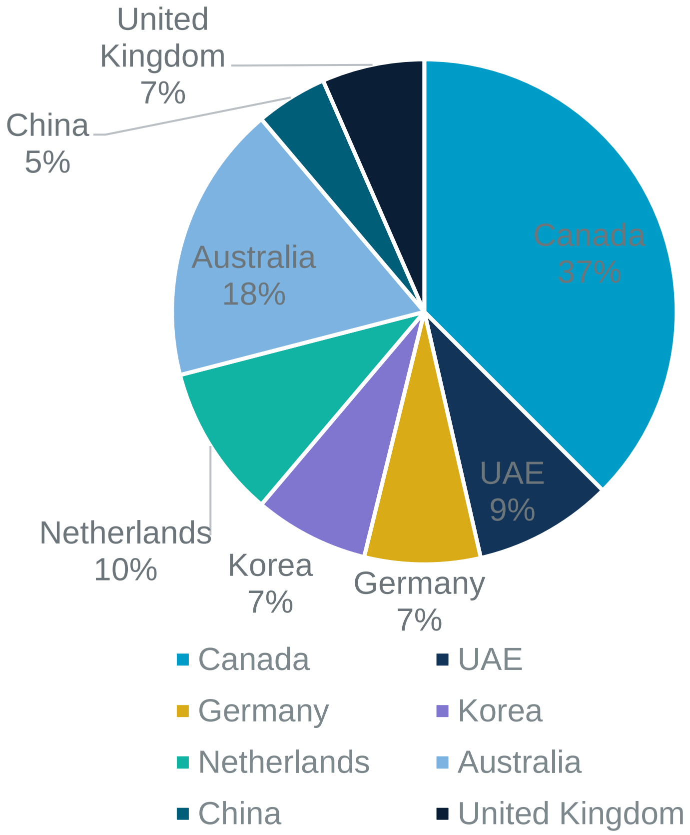
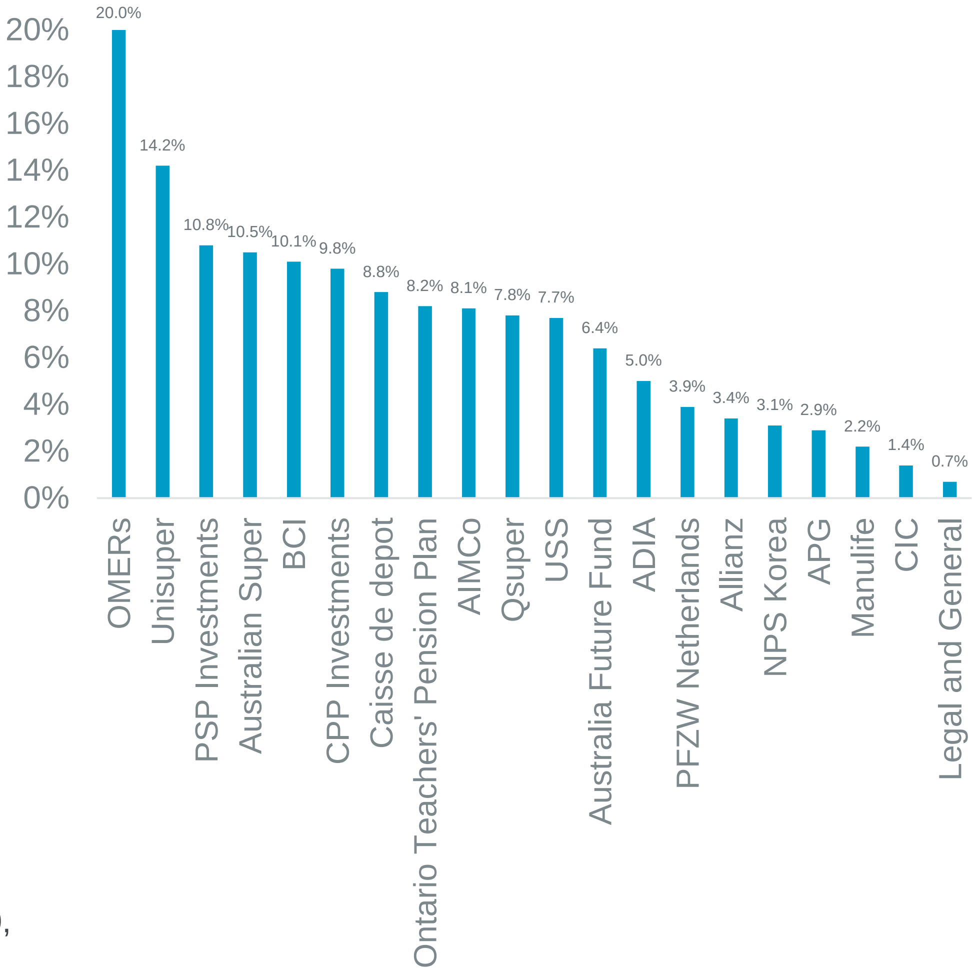
Top 20 Allocators to Infrastructure





Source: Infrastructure Investor, Global Investor 50, June 2021

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How to invest in Infrastructure?

<u>Listed infrastructure securities</u>

+ Diversification by sector and geography
+ Lower management costs
+ “Instant” exposure
+ Relatively liquid investments
– Highly correlated to other portfolio investments
– Subjective selection of infrastructure securities

<u>Unlisted infrastructure fund</u>

+ Leverage fiduciary expertise
+ Governance light
+ Diversification
+ Access to niche areas
– Less control over investment strategy
– Illiquidity of investments
– Performance fees and other fund expenses
– Limited life fund not conducive to infrastructure investing

<u>Direct investment</u>

+ Direct control over investments
+ Alignment of interests
– Large capital requirements
– Recruitment and management of resources
– Limited diversification potential

Infrastructure fund model: the past and present

- Old model – the "safe side of private equity"
- Fund life: 10 years
- Performance target: High IRRs (20%+)
- Cash yield: Low
- Fees: 2 and 20
- Investment philosophy: Capital gain driven
- Cons: Poor duration/inflation hedge

- New model – the "whole asset life" approach
- Fund life: permanent capital
- Performance target: Realistic IRRs (10 to 20%)
- Cash yield: High
- Fees: Vary in types and complexity – back ended
- Investment philosophy: Total return, yield driven with capital appreciation
- Cons: Complexity at exit

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Collaboration the way forward

- Platform built by institutional investors:
  - Lower fees/cost pass-through
  - Better access to deal flow
  - Increased bidding power
  - Manageable leverage
  - Access to expertise with control
  - Deals structured to manage construction risk from greenfield assets
  - Tenor to match investment strategy
- Promising so far:
  - Africa 50 Infrastructure Fund (African Development Bank)
  - Industry Funds Management (Australian pension funds)
  - Global Strategic Investment Alliance (OMERs led)
  - National Investment and Infrastructure Fund (India)
  - Pensions Infrastructure Platform (UK)

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Infrastructure performance

Monica Rossi

17 October 2022

Infrastructure performance

Access to infrastructure

- Through listed infrastructure equities / corporate bonds and private markets
- Within private markets: unlisted funds, external managers, directly at a project level
- Commonly invest with external manager via closed-ended investment vehicle (e.g., LP).

Types of investments

- Greenfield investments – new / early-stage developments, generally higher risk and higher expected returns
- Brownfield investments – previously developed asset, generally lower risk and lower expected returns.

Types of financing

- Debt financing – (includes mezzanine debt) at low-risk end of capital stack, high priority for repayment, lower risk and lower expected returns
- Equity financing – (includes preferred equity) at high-risk end of capital stack, low priority for repayment, higher risk and higher expected returns
- We focused on **private markets infrastructure equity investing** and considered historical performance over almost 20 years ending June 2021.

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Infrastructure performance

	Listed infrastructure	Unlisted infrastructure	Global equities
Return p.a.	10.1%	14.3%	9.9%
Risk p.a.	17.2%	12.3%	16.7%
Sharpe ratio	0.5	1.1	0.5
Correlation	0.89	-0.02	1
Beta	0.92	-0.01	1

Source: Bloomberg, quarterly index prices in USD (January 2004 - June 2021)

- Listed infrastructure (S&P Global Infrastructure Index), unlisted infrastructure (EDEHC infra300 Index), global equities (MSCI World Index)
- Sharpe ratio uses US 3-month Treasury yield as the risk-free rate
- **Past performance is no guarantee of future results**.

Findings:

- Infrastructure has generated higher returns than global equities on average over this period
- On a risk-adjusted basis (Sharpe ratio), listed infrastructure has performed in line with the market
- Listed Infrastructure had a relatively high positive correlation with global equity markets and returns were largely sensitive to market movements over this period suggesting little diversification benefit
- Unlisted infrastructure returns mostly unresponsive to markets movements suggesting returns were driven by factors uninfluenced by market volatility
- Interpret returns with caution: upward pressure on infrastructure valuations seen in last 10 years due to growing institutional demand and too few bankable projects
- Decline in expected infrastructure returns.

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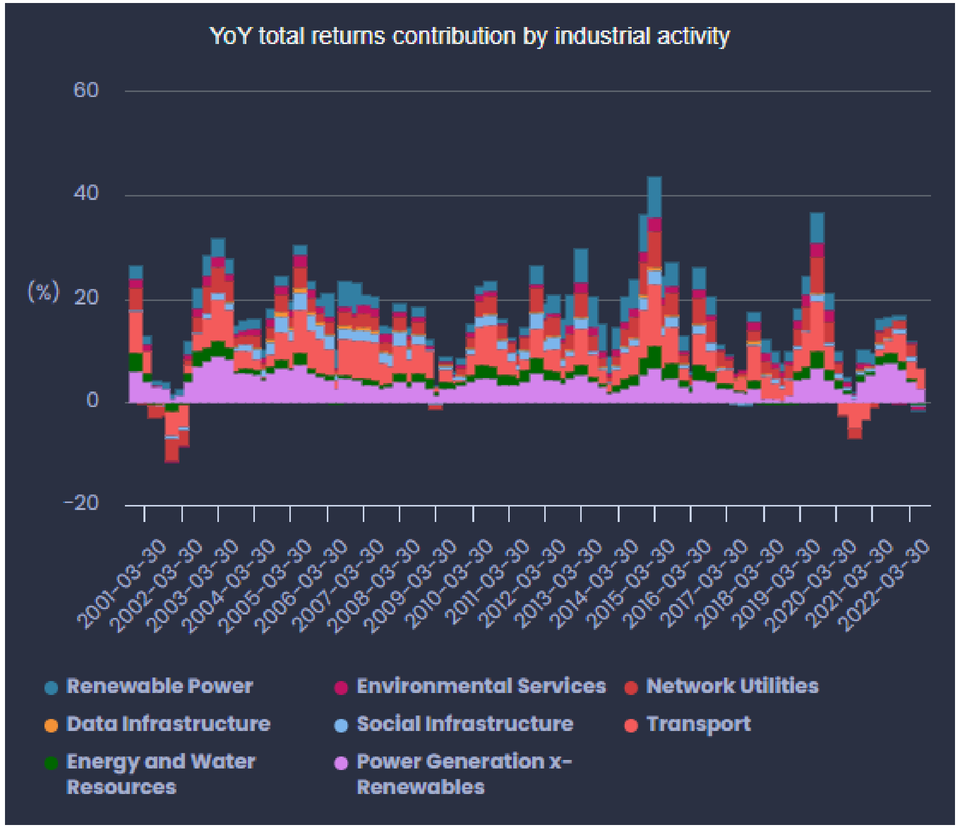
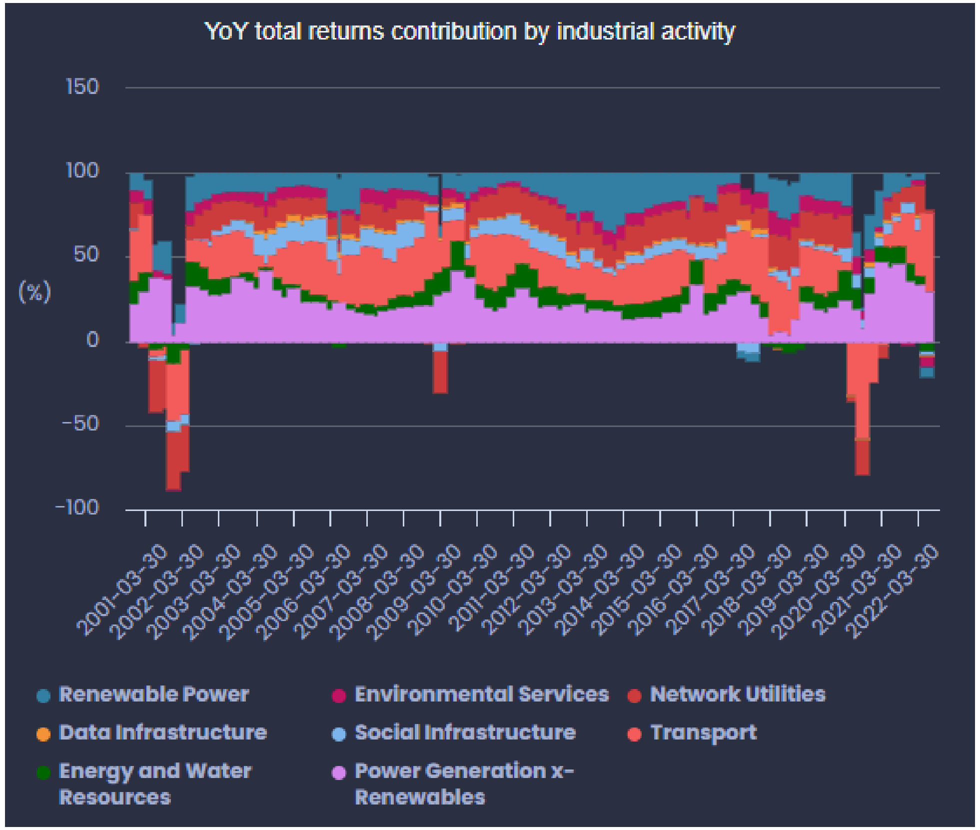
Infrastructure performance





Source: EDHECinfra infraMetrics® infra300 (quarterly), equally weighted, local currency unit (January 2001 – March 2022)

- Uses EDHEC's sector group classifications
- **Past performance is no guarantee of future results**.

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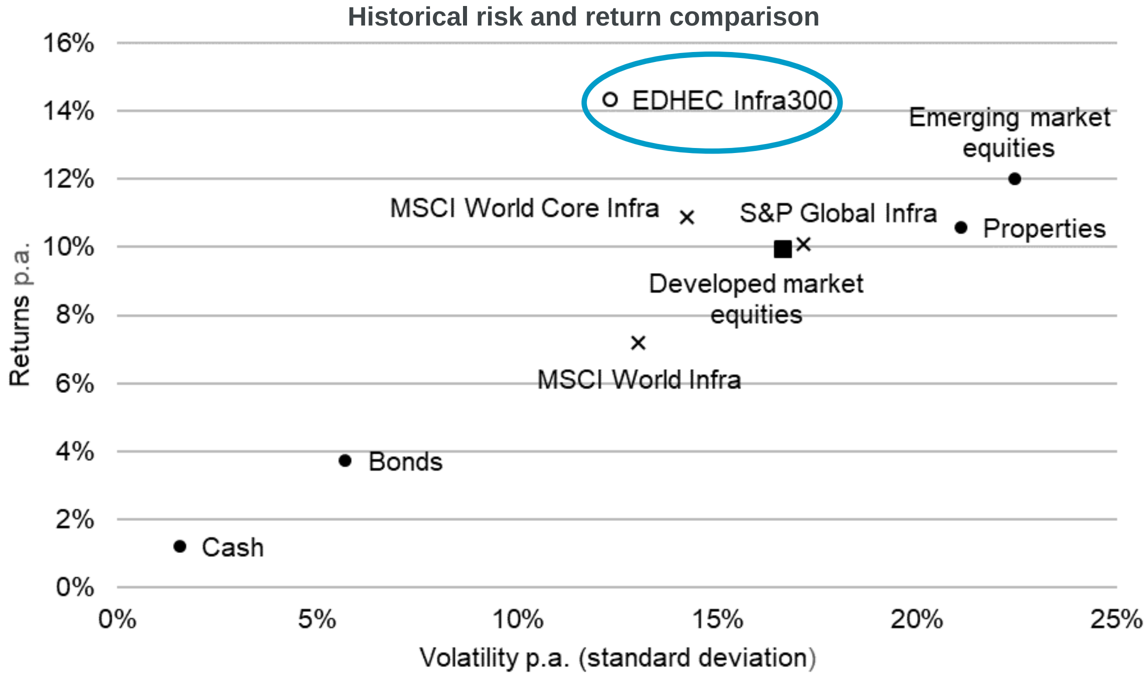
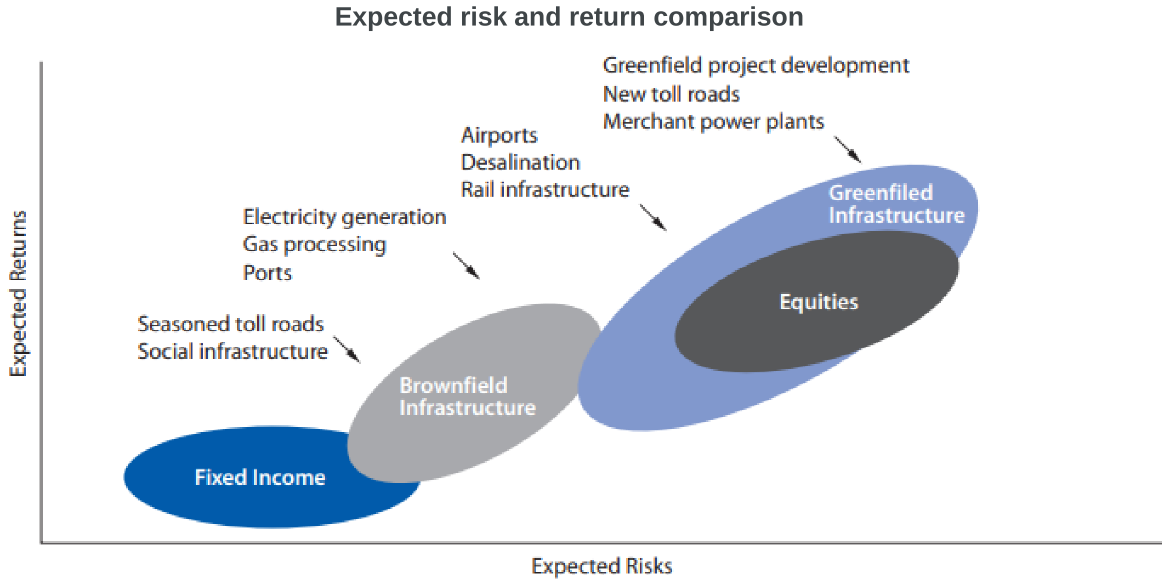
Infrastructure performance



Source: Bloomberg, quarterly index prices in USD (January 2004 - June 2021)

- Developed market equities (MSCI World Index), bonds (Bloomberg Global Aggregate Bond Index), properties (FTSE EPRA NAREIT Developed Index), emerging market equities (MSCI Emerging Markets Index), cash (US 3-month Treasury yield)
- **Past performance is no guarantee of future results**.



Source: European Investment Bank (EIB) Papers, Volume 15, 2010

- Listed Infrastructure exhibiting more volatility than fixed-income assets but less than global properties and emerging market equities
- Unlisted infrastructure stands out with a higher historical return and a lower level of risk, relative to all of the listed infrastructure indices
- What happens if we add unlisted infrastructure to a multi-asset class portfolio?

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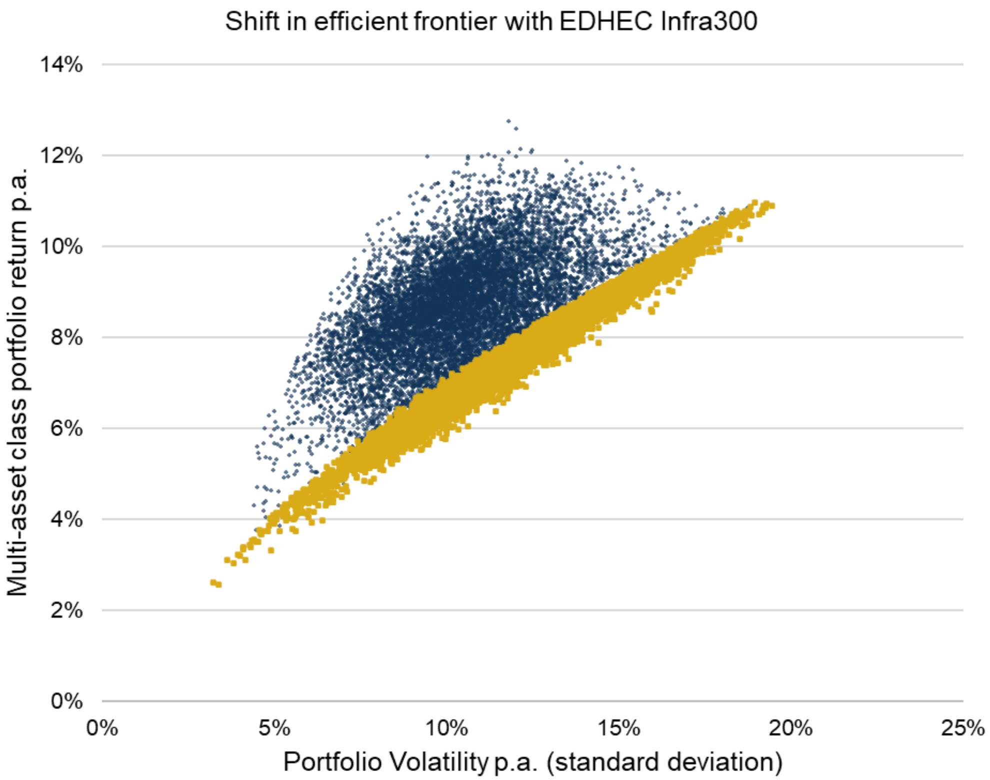
Infrastructure performance



Source: IFoA Infrastructure Working Party using Bloomberg data in USD (January 2004 - June 2021)

- Unlisted infrastructure (EDHEC infra300), developed market equities (MSCI World Index), bonds (Bloomberg Global Aggregate Bond Index), properties (FTSE EPRA NAREIT Developed Index), emerging market equities (MSCI Emerging Markets Index), cash (US 3-month Treasury yield)
- Assumptions: portfolio is fully invested, asset class allocations can range from 0% to 100%, normal return distributions for the underlying asset classes
- **Past performance is no guarantee of future results**.

Historical efficient frontier:

- Plots the set of portfolios that offers the highest return for a given level of risk / the lowest risk for a given level of return
- Riskier portfolios sit further right along the curve
- Curve for portfolios excluding infrastructure (in gold) shifted up and to the left after including infrastructure (in dark blue)
- The portfolios including infrastructure had lower levels of risk for given levels of return
- We did not observe the same effect with listed infrastructure (only MSCI World Core Infrastructure Index caused a noticeable shift)
- Note the limiting assumptions and use of historical returns
- Use expected returns for forward-looking investment decisions.

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UK Infrastructure Bank
Introduction to the Bank 2022

Peter Knott

17 October 2022

FROM BUDGET TO BUILDING CAPACITY

•Originally announced with Government's National Infrastructure Strategy (2020), Budget 2021 set out further details on the UK Infrastructure Bank

•**Location and Staff:** Headquartered in Leeds and operates UK-wide.

•**Operationally independent from Government:** Framework document sets out our relationship with Government

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CORE OBJECTIVES

The Bank's core objectives are to:

- help tackle climate change, particularly meeting our net zero emissions target by 2050;
- support regional and local economic growth through better connectedness, opportunities for new jobs and higher levels of productivity;

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OUR MODEL

£22 billion financing capacity

£8bn debt & equity

£10bn guarantees

£4bn Local Authority loans

Local Authority Advisory Service

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OUR INVESTMENT PRINCIPLES AND USP

INVESTMENT PRINCIPLES

1. Supporting the Bank's objectives to drive regional and local economic growth or support tackling climate change.
2. Investing in infrastructure assets or networks, or in new infrastructure technology.
3. Delivering a positive financial return, in line with the Bank's financial framework.
4. Crowding in significant private capital over time.

USP

1. Where market failures require it, we can take more **risk**, and offer concessional finance
2. Have a **flexible** product offer (debt, guarantees, equity, LA loans) that we can tailor to particular market challenges
3. We offer **partnership** not competition
4. We will provide practical and thought **leadership** to make markets over the long term and convene expertise

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Developing our Investment Priorities

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Our Strategic Plan

•In January 2022 we published our discussion paper "Potential private sector opportunities in priority sector”. The discussion paper set out our understanding of the potential opportunities in our priority sectors.
•**In June 2022, we published our first Strategic Plan**, which established our Strategy, including our investment priorities.
•**Partnership is a core operating principle in the bank.** We have engaged extensively with public and private stakeholders to further our understanding of where there is an undersupply of private finance in the UK infrastructure market and, in addition, how we can support high-value and complex local authority infrastructure projects.
•**Our ambition is to help address market failures** and, in doing so, help direct private investment to projects that bring social benefits as well as financial returns.

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Regional and local economic growth

- **Our strategic plan acknowledges the role that infrastructure can play in addressing spatial disparities** and achieving sustainable economic growth.
- We focus our investments in categories identified by the National Infrastructure Commission:
  - Addressing constraints to growth – e.g. improving transport links
  - Contributing to transformation – e.g. supporting regeneration through economic infrastructure.
  - Universal provision – e.g. ensuring a minimum level of broadband provision across the UK
- **We will target our investments towards supporting three of the missions set out in the Levelling Up White Paper**: employment & productivity, transport infrastructure and digital connectivity.
- **The Bank's Local Authority function** will lend to authorities for high value and strategic projects. We are building out our advisory function as we scale up expertise.

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Developing our investment priorities

Clean energy
Mature renewables, incl. subsidy-free
Less established renewables
Storage
OFTOs and Interconnectors
Nuclear
Retrofit and energy efficiency
Heat networks
CCUS
Hydrogen
Greenhouse gas removals
Digital
Gigabit capable broadband
5G rollout & technologies

Transport
Rolling stock
Zero emission buses
Port infrastructure
EV charging infrastructure
Gigafactories
Sustainable aviation fuel
Water
DPC
Water quality and flood attenuation ecosystem services
Waste
Energy from waste shift to net zero
Recycling

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Case Studies

Deals Already Confirmed 2022

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10 DEALS ANNOUNCED TO DATE

1. South Bank Quay, Teesside

- £107m loan to the Tees Valley Combined Authority.
- Financing a 450-metre quay to service the offshore wind sector, providing opportunities for manufacturing, storage and mobilisation of wind technology on the former Redcar Steelworks site along the River Tees.

2 & 3. NextEnergy: UK Subsidy Free Solar

- Financing two subsidy-free solar farms in the UK, Llanwern (South Wales) and Strensham (Worcestershire) which together will have an installed capacity of 115MW. Llanwern is the largest subsidy-free solar farm built in the UK to date.
- Investing £162mn first close (with up to £250m commitment) in a private 10-year solar infrastructure fund with a target £500m raise and a £1bn hard cap, investing into subsidy-free solar farms in the UK.

10 DEALS ANNOUNCED TO DATE

4. Gigaclear: Ultrafast Broadband for hard-to-reach properties

- Investing £100m as a co-lender in providing high-capacity broadband to hard-to-reach UK premises through internet provider Gigaclear.
- The £100 million from the UK Infrastructure Bank has facilitated £90 million of private sector investment from five other lenders; ABN Amro, ING, Lloyds Bank, Natwest and NIBC.

5. Green Bus Route, West Midlands

- £10 million investment to partner with the West Midlands Combined Authority for Phase 1 of the new Sprint Bus Route in Birmingham, along the heavily congested A45 corridor.
- The project will increase connectivity between residential and employment areas, speed up journey times and reduce carbon emissions, supporting the WMCA to create a zero-emissions corridor by 2030.

10 DEALS ANNOUNCED TO DATE

6. Ultrafast Broadband, Northern Ireland

- £50 million as a co-lender to the broadband provider Fibrus, which is delivering high-capacity broadband to rural homes and businesses across Northern Ireland.
- It will support ultrafast “full fibre” broadband connections to around 220,000 properties, enabling people to access high-speed broadband to work from home and run businesses online from across the country.

7. Octopus Sustainable Infrastructure Fund

- The Bank will be the cornerstone investor into a new fund to provide scale-up capital for the next generation of infrastructure projects across the UK.
- The Bank will invest up to £100m on a match-funding basis, unlocking between £100m to £300m of private capital. The Bank has worked with Octopus Investments to create the fund.

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10 DEALS ANNOUNCED TO DATE

8. CityFibre deal: full fibre broadband, England and Scotland

- The Bank will invest £200 million as a cornerstone lender to support the roll out of full fibre broadband to 8 million UK homes by CityFibre.
- The deal will benefit thousands of families and businesses from Plymouth to Dundee, aiming to provide fast, affordable and reliable broadband to 285 towns and cities across England and Scotland by 2025.

9. NeuConnect (electricity interconnector UK & Germany)

- The Bank is lending £150m to finance the construction of the first direct UK – German transmission link.
- The 2.4bn interconnector will provide 1.4GW of capacity, providing energy security with the expanded grid facilitating the increased supply of renewable generators and potentially lowering costs to consumers.

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10 DEALS ANNOUNCED TO DATE

10. InfraCapital Digital Co-Investing (full fibre broadband)

- The Bank will invest £100 million in matching capital to support InfraCapital underlying companies involved in digital roll-out across the UK
- £30mn drawn to date to provide co-investment equity capital for Gigaclear to enable continued rollout to rural areas.

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UK Infrastructure Bank

Meet the Team

Our Senior Leadership Team 2022

17 October 2022

John Flint, Chief Executive Officer

John is a banker with a wealth of experience in the industry. He is the former Group Chief Executive of HSBC, a company with which he spent 30 years, having first joined them in 1989 as a graduate trainee.

In that time, he worked across the business, serving in various senior leadership positions as Chief Executive Officer of Retail Banking & Wealth Management, Chief of Staff to the Group Chief Executive of HSBC, Chief Executive of Global Asset Management, Group Treasurer and Deputy Head of Global Markets.

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Chris Grigg, Chair

Chris has extensive experience in financial services and business, spending 20 years at Goldman Sachs, latterly as a Partner before becoming CEO of Barclays Commercial Bank. From 2009 to 2019 Chris was CEO of British Land the FTSE 100 property company. Most recently, Chris was a Senior Advisor to the Chancellor of the Exchequer. Chris has been a Non-Executive Director of BAE Systems, the global defence company since 2013 and is currently their SID.

EXECUTIVE TEAM

Ian Brown,
Head of Banking

Annie Ropar,
Chief Finance Officer

Peter Knott,
Chief Risk Officer

Patricia Galloway,
Chief People Officer

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EXECUTIVE TEAM

**Davinder Mann,
General Counsel**

**David Lunn,
Chief Operating Officer**

**Kate McGavin and Helen Williams
Job-share Policy Director**

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EXECUTIVE TEAM

Urvashi Parashar,
Chief Impact Officer and
Chief Economist

Stuart Nivison,
Head of Portfolio
Management

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NON-EXECUTIVE DIRECTORS

Bridget Rosewell CBE

Tania Songini

Nigel Topping

Marianne Økland

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An outsider's perspective on private infrastructure

Oliver Morency, EDHEC*infra*

17 October 2022

Making investment decisions without data is like trying to fly a plane without instruments

- Keith Ambachtsheer

- Some ground rules –
- Infrastructure / unlisted / private / infra – interchangeable, not listed infra stocks
- Most data are on a total infrastructure company basis (equity+debt)
- Risk factors, default to the equity examples, we have debt also

The only Independent provider of data and analytics specialising in unlisted infrastructure

- The Mission – bring transparency to private infrastructure as an asset class, retain
- academic rigour and curiosity in our research, provide industry ready tools
  - Real assets
  - Financial assets
- Find fair value under IFRS 13 accounting principles, NAV unreliable

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EDHEC*infra* credentials

- EDHEC*infra* credentials
  - Recently awarded EU benchmark administrator status by **ESMA**
  - Partnering with the working group of the **G20 and EIOPA**
  - Our tools are trusted by investors with infra exposure of **USD $340bn** and counting
- We work directly with asset owners, their consultants, managers, advisers and valuers.

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Economic criteria of infrastructure assets, a bottom-up, risk-based approach

- *Contracts not concrete*
- Infrastructure investment - high-sunk-cost, long-term investment in immobile, single-use assets
- Physical characteristics of tangible infrastructure only determine the need for long-term contracts
- Contracts determine a company's investment profile
- Outside of contractual and regulatory relationships, tangible infrastructure assets have no or little value
- This differentiates infrastructure from other real assets
- It needs to be used to have value. And usability is determined by a contractual commitments

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The data that drives our research

- The data that drives our research
- **Audited financial accounts for hundreds of private infrastructure companies**

✓ Income statements

✓ Balance sheets

✓ Cashflows

- Observe underlying cashflow risks
- **The Infrastructure Company Classification Standard – TICCS®**

▪ Objective framework to organise infrastructure data

▪ TICCS® buckets the equity risk premia in unlisted infrastructure assets

▪ Compatible w/o classifications schemes, e.g., the EU Green taxonomy

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A relevant method for quantifying risk & return

- Big challenge – lack of trading in real assets to pick up pricing signals
- **We use Factors – a way of describing differences between returns**
- Systemic risk factors visible across all infrastructure companies

KEY RISK FACTOR	DEFINITION	EXPECTATION
Size	Total Assets	Bigger company equals higher premia
Profit	Return on Assets before Tax	More profits equal lower premia
Investment	Capex over Total Assets	Greater spend equals higher premia
Leverage	Total Senior Liabilities over Total Assets	More borrowing equals higher premia
Term	20-year public bond yield minus 3-month public bond yield	Higher the spread, the higher the premia
TICCS® Business risk bucket	Merchant, Regulated, or Contracted	Systematic risk pricing range across 3 contract types
TICCS® Sector risk bucket	Industrial acitivity, e.g. renewable power	Sectors carry higher or lower premia

- We use audited company financials to estimate factor loadings
- Cross-referenced with transactions – deal IRRs, we decompose
- **The result – a risk adjusted average price for <u>every company traded or untraded</u>**

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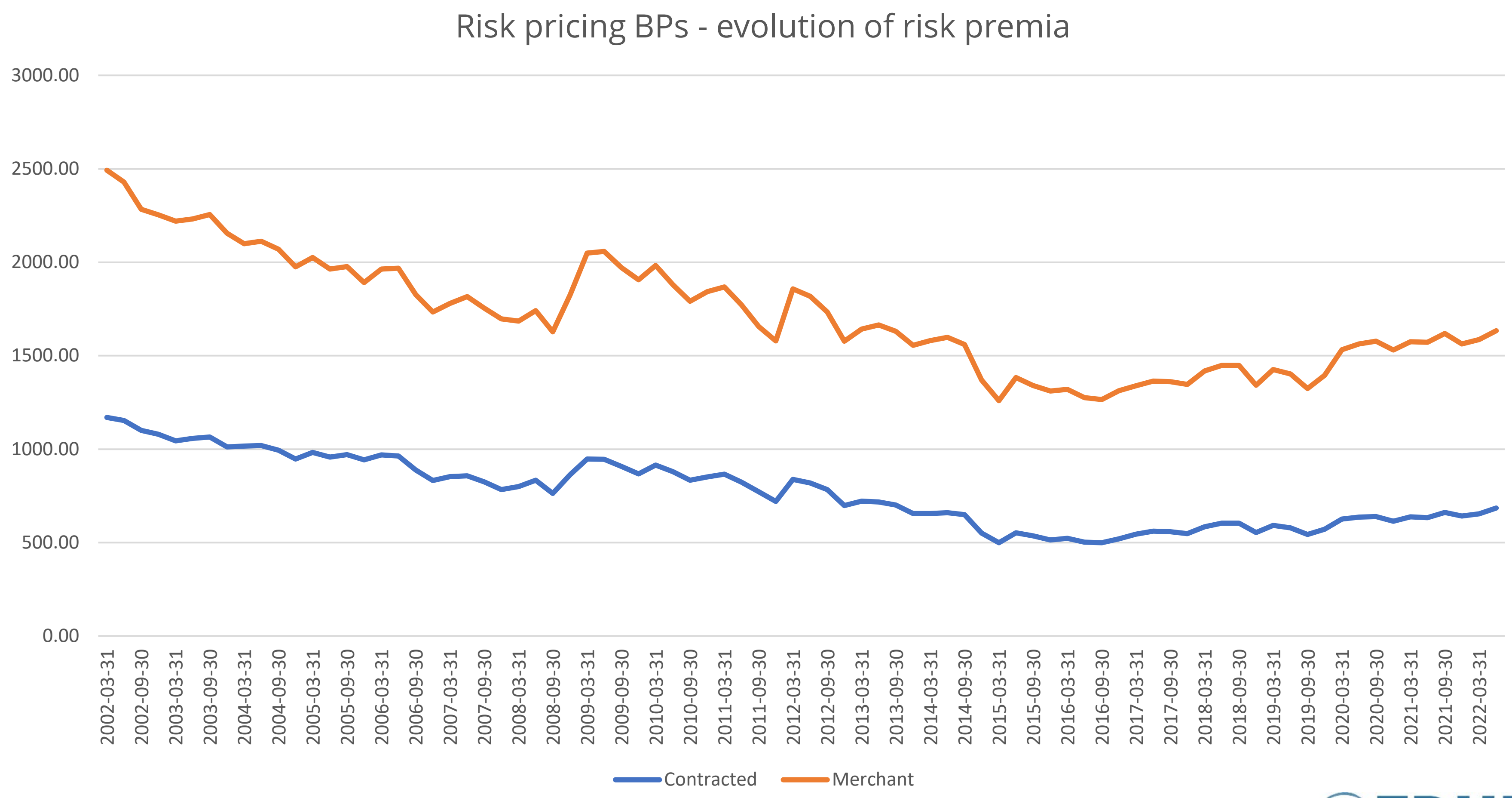
Mind the gap – business risk matters



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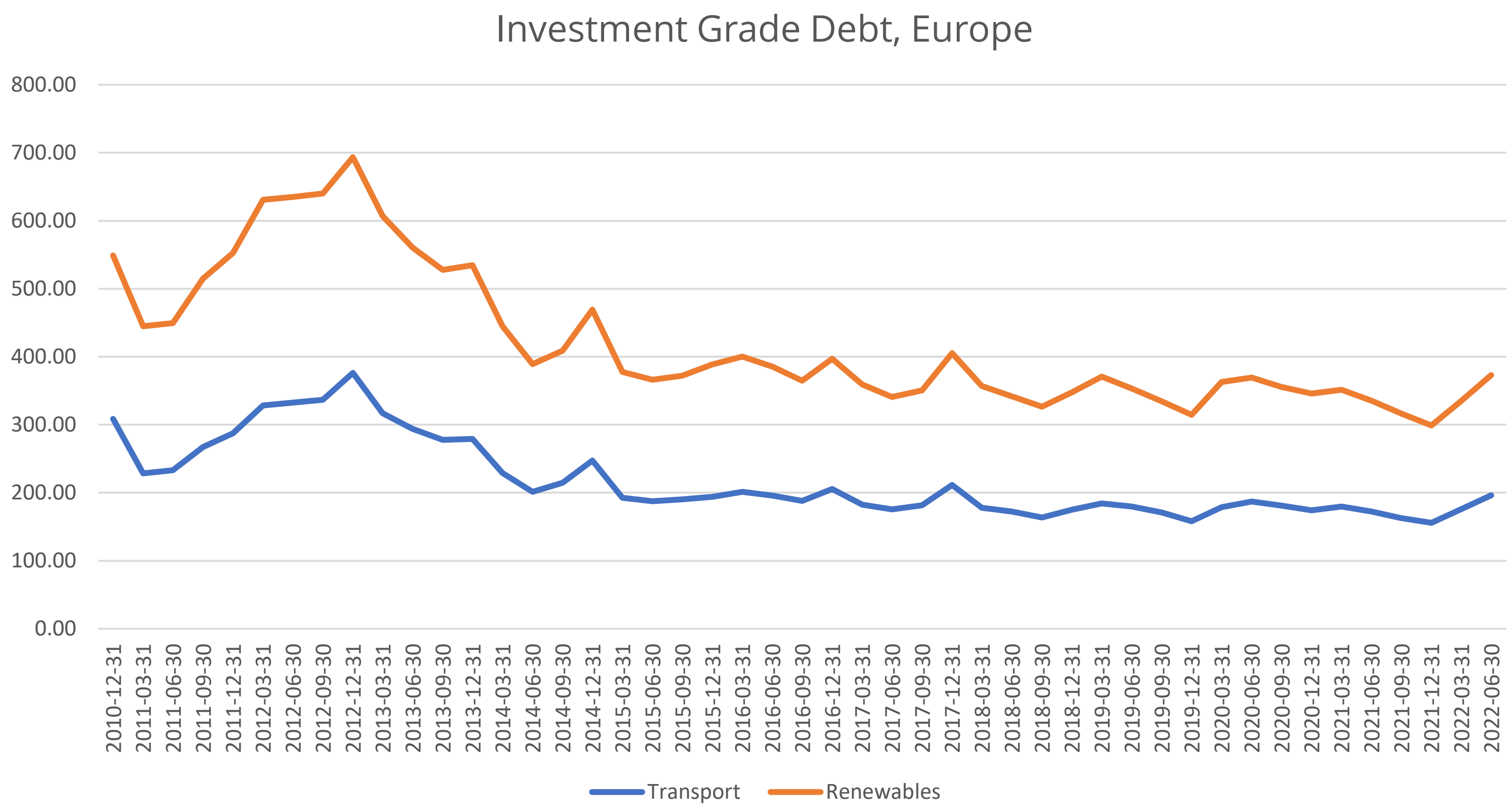
Business activity = sector



- Business model risk and business activity risks matter
- Contracts not concrete
- Infrastructure different to other real assets, and PE
- Possible to run analysis on the underlying, and now at fund level

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Your EDHEC resources

- ✓ At your service, please contact me via Rosie IFoA - eventmanagement@actuaries.org.uk
- ✓ Research papers and thought-leadership via https://edhec.infrastructure.institute/research/ - always FOC
- ✓ Online and in-person events – typically FOC
- ✓ Performance & risk solutions / tools – Always well-priced

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Further EDHEC resources

- Our most recent video which talks to the resilience of the asset class, entitled *Is infrastructure shockproof?* is available here - https://www.youtube.com/watch?v=WhNBNTslS-4&t=75s, and the corresponding paper is available to download without charge here https://edhec.infrastructure.institute/research/
- As is our study charting *The Volatility of Unlisted Infrastructure Investments (2010 – 2020)*
- Additionally, *Everything you always wanted to know about infrastructure but never knew who to ask,* complements the presentations we listened to in the session https://www.youtube.com/watch?v=WhNBNTslS-4&t=75s
- FAQs on our data and methods are available here https://docs.edhecinfra.com/display/FAQS
  Including TICCs, the Infrastructure Company Classification Standard

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ESG and sustainability outcomes in infrastructure investing

Simon Whistler
Head of Real Assets
Principles for Responsible Investment

17 October 2022

From ESG risk analysis…

- ‘Traditional’ focus of ESG in infrastructure investing has been on identifying material risks and potential opportunities

Social licence to operate and impact on communities

Protection of biodiversity

Climate change risks

Land and indigenous rights

Workplace health and safety

Labour rights and relations

Changing tax policy

Bribery and corruption

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…to achieving key sustainability outcomes

- Increasing focus – including through regulatory pressure – for investors, including in infrastructure, to help achieve global goals:

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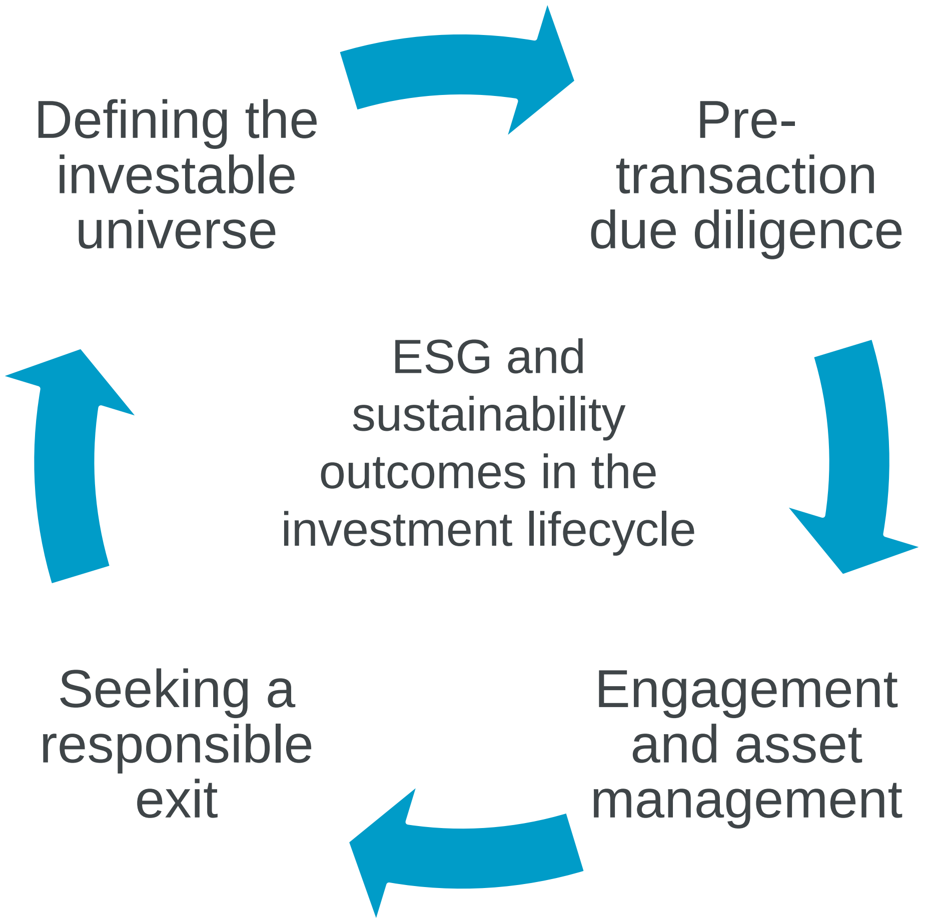
Different levers for action



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