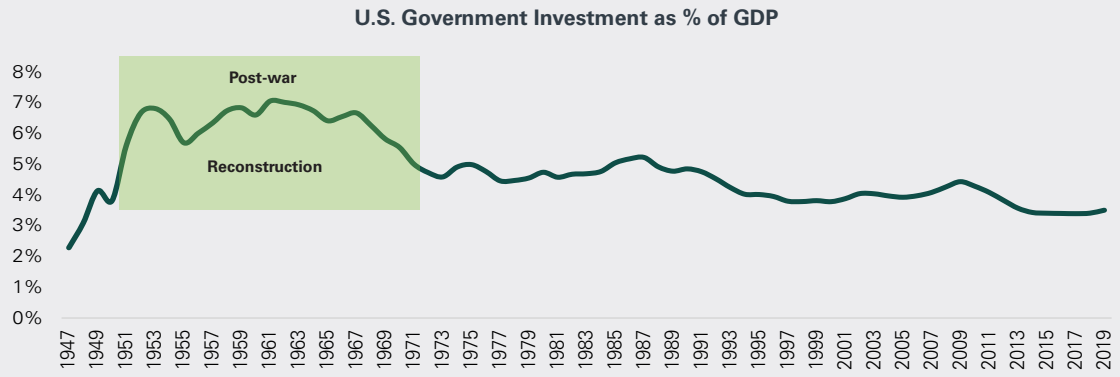
Listed vs Private Infrastructure:
Closing the gap in a decarbonising world

Summary

Throughout history, infrastructure development has been a necessary as well as a key enabling factor for economic growth. Today more than ever, the urgency to mitigate the consequences from centuries of expanding prosperity (think climate change) and accommodate rapidly increasing mobility, urbanisation and digitalisation, commands the need for more (and better) infrastructure.

The bulk of the infrastructure that we live with, particularly in OECD countries, was built post WW II in the 1950s and 1960s. Since then, Government spending on infrastructure has been declining, from 6-7% of GDP in the U.S. to 2%-3% in the U.S., Europe and Japan today (see chart 1). Hence the need today to replace ageing infrastructure, on top of the investments required by the fast emergence of new forms of energy.

Chart 1: Government spending on infrastructure is falling short of requirements

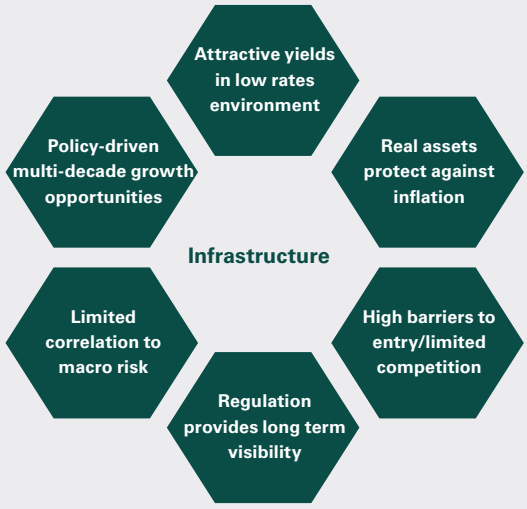


Source: U.S. Bureau of Economic Analysis

Over the last decade, increasingly rich fixed income and equity market valuations and ever lower interest rates have encouraged multi-asset investors to diversify into infrastructure in search of stable and visible cash flows (which particularly regulated infrastructure is able to provide) and limited correlation to potential downturns in the macroeconomy. The potential for these assets to provide protection against the risk of rising inflation has also appealed. More recently, substantial growth opportunities, such as the one driven by increasingly ambitious climate policies around the globe, are further enhancing the attractiveness of infrastructure as an asset class.

While c.200GW of new wind and solar power generation capacity was added worldwide in 2019, one can estimate that such an annual pace will need to more than double over the next three decades to reach the 2050 zero net carbon emissions target reiterated by this year's EU Green Deal (in line with the 2015 Paris Agreement goals) and numerous corporates worldwide.

Chart 2: Infrastructure – a highly attractive asset class



Source: Ecofin

In this paper, we investigate the different ways for investors to access investment opportunities – in particular driven by accelerating global decarbonisation – which are set to underpin multi-decade growth trends in global infrastructure. While listed infrastructure immediately screens as highly attractive on valuation compared with private alternatives, we show that this discount has persisted for many years and only recently started to narrow (Section 1). To understand how listed infrastructure could further "close the gap" to private valuations, we analyse three key drivers which we believe will be pivotal in attracting investor interest to the asset class over the coming years (Section 2). Firstly, we analyse the case study of coal power plant ownership in Europe to show that listed infrastructure's ESG credentials are significantly better (cleaner) than those of private owners – both on a static and forward-looking basis. Secondly, we highlight that private infrastructure valuations have grown very much in line with the amount of capital allocated to the asset class; as asset owners start to look to listed assets for better value and diversification, this may equally support listed valuations. Thirdly, we highlight that the growth in competition for private infrastructure assets likely has (and might continue to) compress returns, notably as investors demand lower premia for the illiquidity of the asset, creating a further incentive for capital allocators to look to listed investments for more attractive returns. In the final section of the report (Section 3), we also provide a detailed recap of the five key features which traditionally have attracted investors to listed infrastructure: higher liquidity, better risk diversification, access to unique monopoly assets, greater scope for alpha generation and more prudent financial structures.

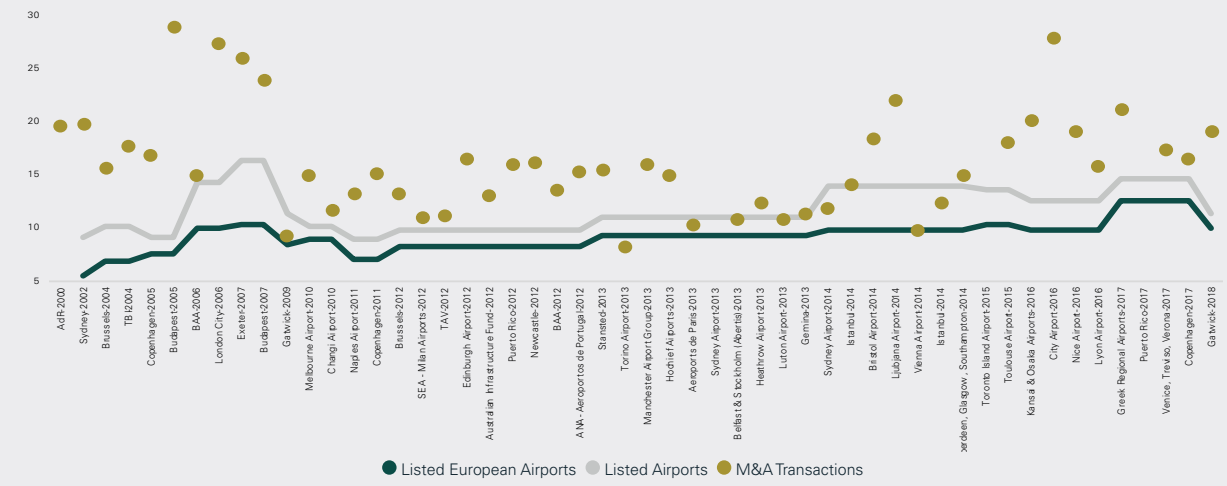
Section 1. The valuation gap between listed and private infrastructure

A key question for investors is whether to gain exposure to infrastructure through a private angle (usually focused on the financial ownership of operating assets) or the equity of listed infrastructure companies. While historically private investments have been the norm, listed infrastructure as a distinct asset class is now readily available and – we would argue – should continue to grow for many reasons.

The prime appeal of listed infrastructure exposure is its more attractive valuation. The examples below from the utility and transport industries highlight a significant gap between listed and private valuations and the multiples paid by private investors to acquire comparable assets.

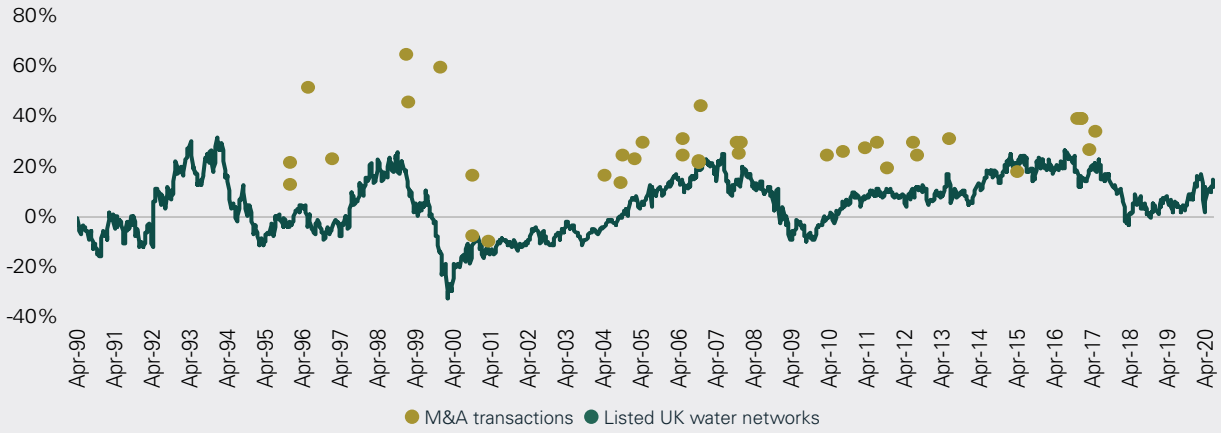
A clear example of this are airports globally, where over the past two decades private M&A transactions have been concluded at valuations (EV/EBITDA multiples) which have been, on average, 40% higher than the valuations for listeds, with individual premia on several transactions exceeding 100% (Chart 3). Similarly, private takeovers in the UK water sector over the past three decades have been undertaken at an average valuation premium of c.30% over the target's regulated asset base, while listed water networks have traded on average at a c.5% premium (Chart 4). More recently, transactions in the renewables sector valuing offshore wind assets at nearly double the invested capital (often prior to any investment having taken place) suggests that the divergence between public and private valuations can be particularly pronounced for "in favour" assets (Chart 5).

Chart 3: Airport M&A transactions have been concluded at significant valuation premia (EV/EBITDA)



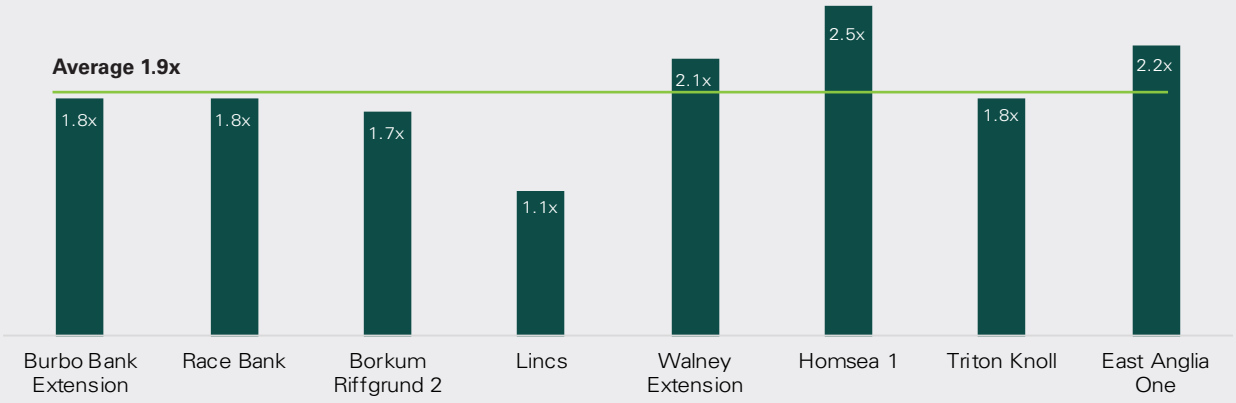
Source: Exane

Chart 4: ...as have transactions in the UK water networks space (Premium to regulated asset base)



Source: Macquarie

Chart 5: ...and, more recently, on offshore wind farm-down transactions (EV as a multiple of invest capital)



Source: Company disclosures, Bloomberg

Valuations for listed infrastructure stocks also appear attractive relative to their own recent history. As shown in Chart 6, global listed infrastructure offers yields which are about 350bps in excess of average government bond yields (proxied by an average of U.S. and European 10-year sovereign yields). The same spread was c.50bps ten years ago and troughed at negative 150bps in the period preceding the 2008 financial crisis. On the one hand, this suggests that listed infrastructure valuations still need to fully price in the global decline in interest rates; on the other hand, it implied that listed valuations should also be somewhat shielded against an inflection in global yield curves and a return of inflation.

Chart 6: Spread between S&P Global Infrastructure Index yield and global bond yields*

Source: Bloomberg. *50% 10-year U.S. treasury yield, 50% generic 10-year Eurozone sovereign yield

Section 2. Closing the gap: three drivers causing listed returns to catch up

Historically, private infrastructure has attracted significant investor interest due to its ability to deliver attractive returns with an uncorrelated profile. Indeed, over the past decade, private infrastructure has achieved total returns (capital appreciation + cash yield) which significantly exceed those of listed infrastructure, according to EDHEC data. More recently however, the returns of listed infrastructure have been catching up with those of privates, as shown in the table below.

Chart 7: Annualised total returns (pre-COVID)

	Last 10 years Feb 2010 - Feb 2020	Last 5 years Feb 2015 - Feb 2020
Private infrastructure (EDHEC Infra300 Index)	16% p.a.	7% p.a.
Listed infrastructure (S&P Global Listed Infrastructure Index)	8% p.a.	7% p.a.

Source: Bloomberg, EDHEC Infrastructure Institute**

We see three main drivers for this convergence of listed and private infrastructure returns:

1. Listed infrastructure screens as significantly 'cleaner' environmentally, both from a static perspective and on a forward-looking basis. As ESG metrics become more and more important, investors may increasingly look to allocate capital accordingly.

2. Private infrastructure returns have been supported by substantial fund flows into the asset class which, in turn, have increased competition for such assets. As returns compress due to higher valuations, investors may diversify their capital allocation into areas offering better value;

3. Increasing numbers of transactions may have also reduced investors' sensitivity to private infrastructure's illiquidity, lowering required returns and boosting valuations.

A critical aspect that the ongoing COVID pandemic has brought to the forefront is the substantial difference in volatility between public and private valuations. Particularly during times of financial market stress, private ownership is often praised as a way to protect value given the greater stability of private valuations (which are typically based on appraisal value in the absence of recent transactions). It is however critical to recognise that the higher volatility in the value of listed assets is often not related to an idiosyncratic decline in the assets' intrinsic value vis-à-vis private alternatives, but rather to public markets' ability to more quickly and efficiently reflect the impact of changing economic conditions on asset prices. Private valuations may therefore be more stable, but likely as a result of the smoothing effect caused by infrequent, appraisal-based valuation methodologies rather than more resilient fundamentals (which, in fact, are likely to be affected by the changing economic environment on equal terms with their publicly listed peers).

Driver 1: Listed infrastructure is the "cleaner" option

Listed infrastructure often fares better on ESG metrics owing to a virtuous cycle that sees the public market's greater focus on such credentials as a strong incentive for listed companies to improve their ESG strategies, disclosure and ratings. This in turn helps listed infrastructure attract capital from a rapidly increasing number of investors eager to embrace ESG principles. An analysis by research firm Opimas suggests that the global AUM managed according to ESG criteria doubled over the past four years to >$40 trillion, and continues to increase.

Chart 8: Listed infrastructure's ESG credentials could help attract more capital

Source: Ecofin

To provide a concrete example, we can look at a case study of coal power plant ownership in Europe – perhaps the most prominent ESG topic in the energy industry. Our analysis shows that listed utilities have cleaner portfolios today – as a result of more substantial efforts over the past decades to retire heavily polluting coal capacity – and rank better on a forward-looking basis too, thanks to wide-ranging commitments to retire their remaining coal exposure and very limited commitments to develop more of it.

Specifically, as shown in the tables below (chart 9) which summarise coal power plant ownership in Europe, our analysis finds that:

- Since 2005, listed utilities have retired nearly 40% of their coal fleets, compared to only c. 20% for private coal power plant owners;
- While both listed and private utilities continue to operate coal power plants, listed utilities have earmarked c. 60% of their remaining fleet for retirement or an emission-reducing fuel switch soon. The comparable proportion for private operators is at least 20 percentage points lower;
- Crucially, private investors continue to allocate significant capital to coal projects despite its environmentally damaging profile: nearly 90% of new coal capacity planned in Europe is owned by private firms, while only about 10% of the projects are owned by listed utilities;
- The hiatus becomes even clearer when compared to current generation portfolios: while private developers are pursuing new coal projects equivalent to more than 50% of their current fleets, new coal projects correspond to only about 4% of listed utilities' current fleets.

Chart 9: Coal power plant ownership in Europe

Analysis 1 - % of fleet retired since 2005

Owner type	% initial fleet
Listed	39%
Private	20%
Government	25%

Analysis 2 - % of open power plants with plans for retirement or fuel switch

Owner type	% open fleet
Listed	59%
Private	38%
Government	63%

Analysis 3 - market share of planned new coal power plants

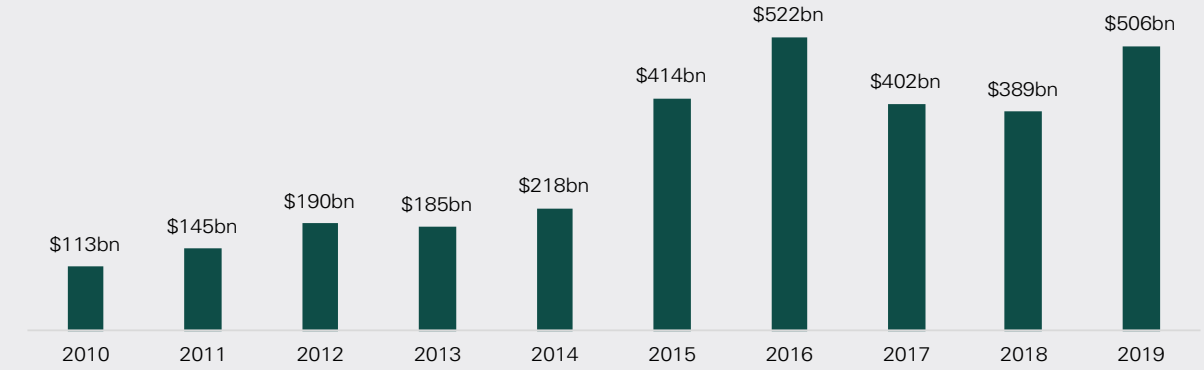
Owner type	% of planned projects
Listed	10%
Private	87%
Government	3%

Source: Europe Beyond Coal: European Coal Plant Database (17 July 2020)

Driver 2: Private infrastructure investors seeking better value and diversification

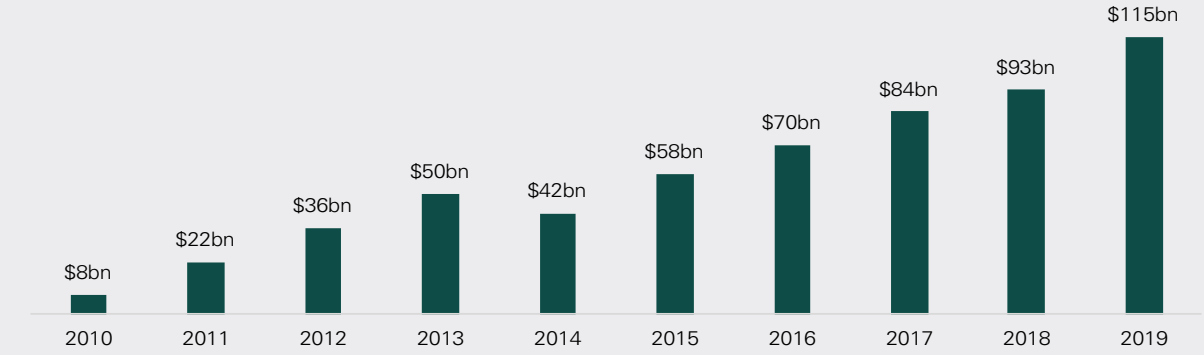
Over the past decade, private infrastructure returns have been supported by the rapid inflow of capital into the asset class. As shown in the charts below, the increasing nominal value of transactions globally has very closely followed the capital flowing into private infrastructure investment vehicles. Over the years, competition for infrastructure assets may have pushed investors with capital to deploy to accept higher valuations, while shielding equity returns by using higher leverage, made viable by falling interest rates.

Chart 10: The increase in the value of infrastructure deals...(Aggregate value of private infrastructure deals globally)



Source: Preqin

Chart 11: ...has coincided with a significant increase in fund flows (Capital raised for private infrastructure funds globally)



Source: Preqin

With headline returns now lower for privates, interest rates potentially close to the trough, and with significantly more attractive valuations in public markets, we would expect investors to diversify allocations into the listed space. This may be a force in bringing returns in the private and listed infrastructure space more closely into alignment. As shown below, some recent transactions point in this direction already.

Chart 12:

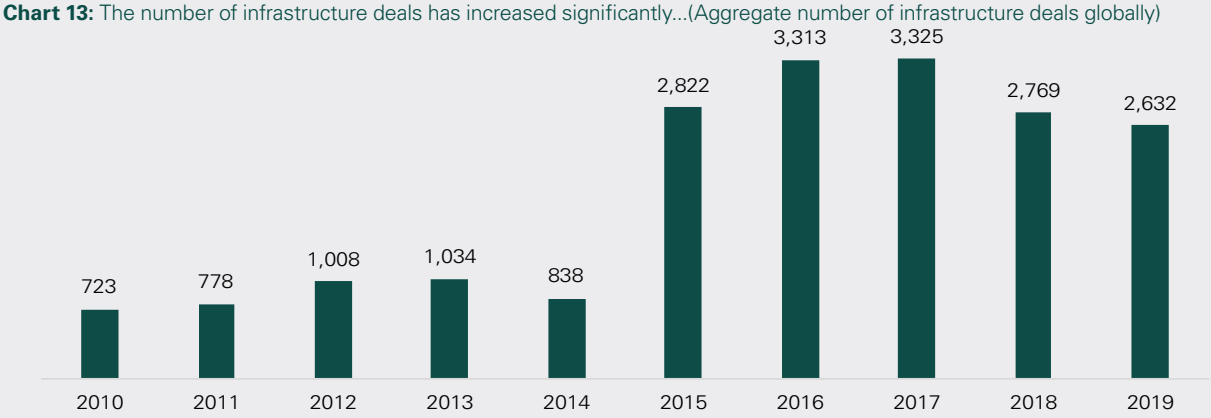
Acquirer	Target	Completion date	Deal type
Brookfield Renewable Corp.	TerraForm Power	August 2020	Listed infrastructure fund acquiring listed renewables developer
Canada Pension Plan Investment Board (in consortium)	Pattern Energy	March 2020	Pension fund acquiring listed renewables developer
Capital Dynamics	8Point3 Energy Partners	June 2018	Private equity fund acquiring listed solar farm developer
Macquarie, GIC	Energy Development Corp. (EDC)	August 2017	Infrastructure investors acquiring listed geothermal developer

Source: Bloomberg, Reuters

Driver 3: Increased number of private transactions may have reduced illiquidity premia

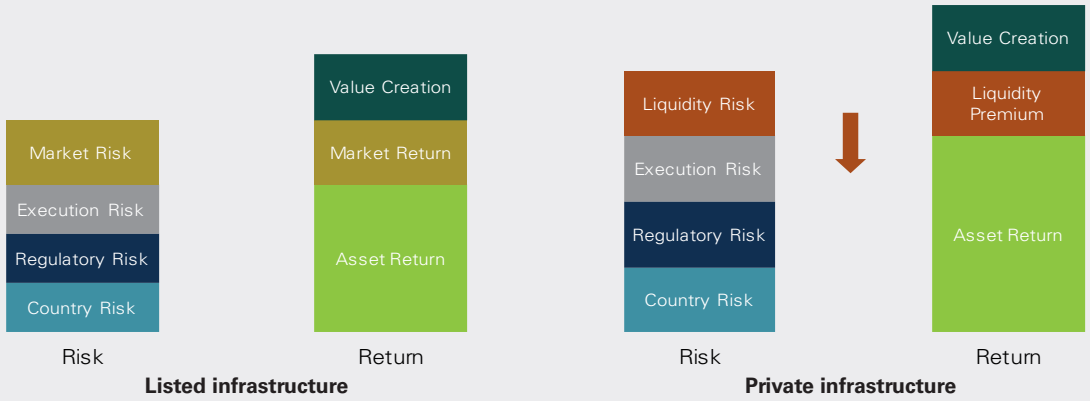
The growth in the private infrastructure market may have also served to reduce the illiquidity premia for private assets. As a greater volume of transactions takes place year after year (as shown in chart 13), investors in privates may have grown more comfortable with the ability to exit assets at the end of their prospective holding period and may, therefore, demand lower premia to compensate for illiquidity of the asset (which nonetheless remains significant compared to listed infrastructure equivalents).

Chart 13: The number of infrastructure deals has increased significantly...(Aggregate number of infrastructure deals globally)



Source: Preqin

Chart 14: ...likely reducing illiquidity premia for private investors (Indicative breakdown of infrastructure risk and return)



Source: Ecofin

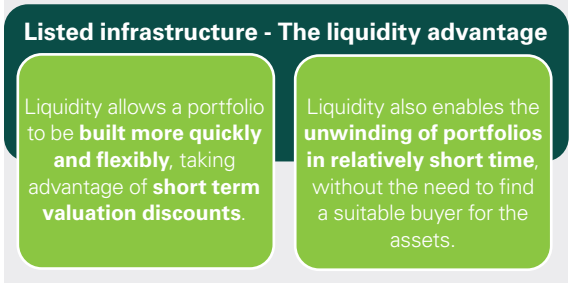
Section 3. Infrastructure investing: five key features favouring listed over private

While an attractive valuation is a necessary condition for investors to boost allocations to listed infrastructure, it is likely insufficient to catalyse a material shift in preference between private and listed infrastructure exposure. We therefore identify five more reasons why, in our view, listed infrastructure could increasingly attract investors' attention and capital over the coming years.

Feature 1: Liquidity

The most obvious feature of listed infrastructure stocks is their liquidity, offering the ability to build exposure quickly, take advantage of fluctuations in market valuations and minimise cash drag by accelerating capital deployment. Investing through listed assets allows investors to liquidate positions over a relatively short time frame too as public markets offer a relatively effortless and immediate platform to offload assets. In a similar scenario, private asset owners could need to weather a worsening of fundamentals in the time required to identify a suitable buyer for their assets.

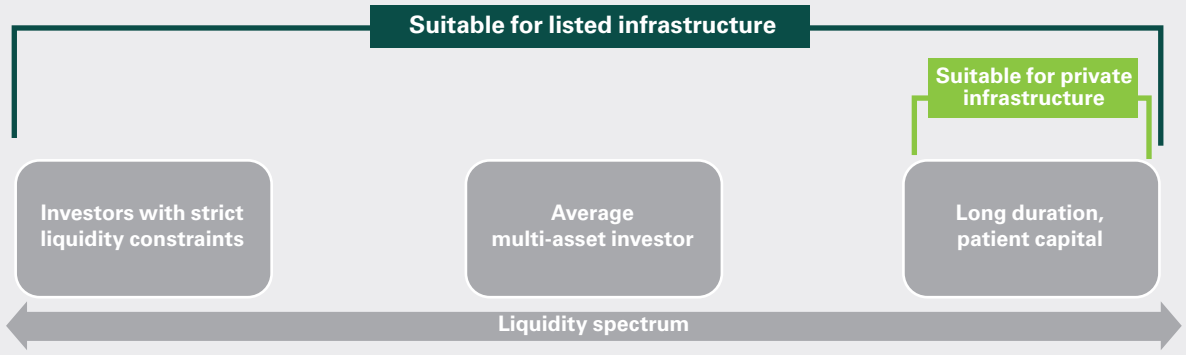
Chart 15:



Source: Ecofin

In addition to providing greater flexibility, the inherent liquidity of listed infrastructure stocks makes funds and products based on them more easily marketable as the favourable liquidity terms make them accessible to a broader spectrum of investors.

Chart 16:

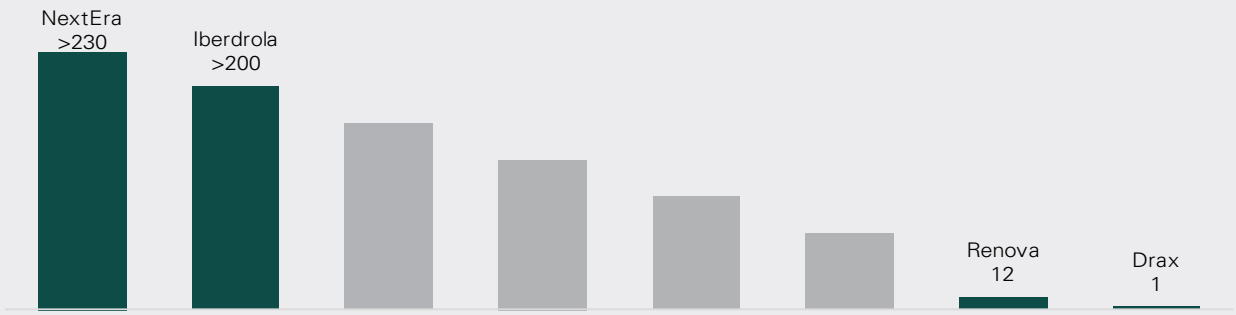


Source: Ecofin

Feature 2: Risk diversification

Listed infrastructure permits diversification of the risks associated with the specific activity that the assets undertake. Unlike private ownership, which is typically restricted to a single or small number of similar assets, listed infrastructure provides both a directional exposure (such as one airport or one power plant, usually at a better valuation as discussed above) and, crucially, the option to invest in companies whose portfolios are diversified across geographies (thereby mitigating interest rate, currency and regulatory risk) and technologies (e.g. combining toll roads and airports, or wind and solar).

Chart 17: Listed infrastructure offers a wide spectrum of exposures...(number of renewable assets in operation, excluding hydro)



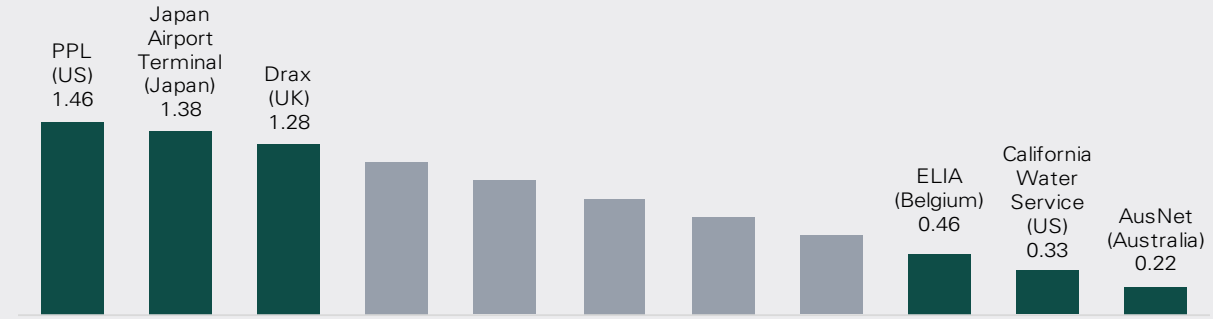
Source: Company disclosures, Ecofin

Chart 18: ...ranging from highly concentrated to very diversified portfolios (number of airport assets in operation)

Source: Company disclosures, Ecofin

Clearly, it should not be disregarded that investing in listed infrastructure adds market risk which does not affect private assets. However, we note that within the listed infrastructure universe, Beta versus the general equities index can vary significantly from well below 0.5 (for names such as AusNet and California Water Service) to well above 1.0 for names more geared to the state of the macroeconomy (such as airport operators and utilities exposed to the power price). This offers investors – like us – the ability to actively manage exposure by allocating capital along this spectrum of sensitivities.

Chart 19: Listed infrastructure offers a wide spectrum of risk profiles (Raw Beta to respective country index benchmarks)



Source: Bloomberg

Feature 3: Access to unique monopoly assets

A third, often underappreciated, aspect is that thanks to decades of privatisations, particularly in Europe and Latin America, numerous former state-run monopolies are now listed and accessible to investors. These assets offer unique risk profiles owing to the absence of both direct and indirect competition given their monopolistic nature. Examples include rarely accessible natural monopolies such as national electricity transmission networks in Europe (e.g. Terna in Italy, Red Electrica in Spain or Elia in Belgium) and water networks in the U.S. (American Water Works, American Water Resources and Aqua America/Essential Utilities), and some unique situations such as AENA, the sole operator of Spain's 48 airports, and ENAV, Italy's air traffic control monopoly, the only listed company of its kind in the world.

Chart 20:

Listed asset	Next best privately owned asset
Terna/Red Electrica/Elia **Business:** Electricity transmission network operators in respective countries (Italy, Spain, Belgium/Germany) Business type: Regulated **Key Advantage:** Sole owner of the infrastructure within national borders, no competition	Private electricity distribution company **Business:** Electricity distribution network in a confined region of a country **Business type:** Regulated **Key Disadvantage:** Fixed-term concessions assigned through competitive tenders. Indirect competition through regulatory benchmarking across multiple operators (single operators can underperform if less efficient)
AENA **Business:** Sole owner and operator of Spain's 48 airports **Business type:** Regulated **Key Advantage:** Sole owner of the infrastructure within national borders, no competition	Heathrow Airport Holdings / SEA Milano **Business:** Partially private owners/operators of single or subset of regional airports **Business type:** Regulated **Key Disadvantage:** Individual airports are in direct competition with other country/regional hubs (e.g. Heathrow vs Gatwick, Milan vs Rome)
ENAV **Business:** Sole operator of terminal and flyover air traffic control on Italian air space **Business type:** Regulated **Key Advantage:** Indefinite concession granting monopoly over both terminal (within 25km of airport) and flyover air traffic control services for the entirety of Italian air space	NATS **Business:** Only other major air traffic control operator in partially private ownership. **Business type:** Regulated **Key Disadvantage:** Fixed-term concessions awarded through competitive tenders. Exposed to regional airport competition (NATS operates terminal traffic control for only 15/40 UK airports)
American Water Works, Essential Utilities, American States Water Co. **Business:** Conglomerate of regional water and wastewater network monopolies in the U.S. **Business type:** Regulated **Key Advantage:** Few large players in a highly fragmented industry, leverage scale to act as consolidators and extract synergies, no competition	Bayonne Water, Middletown Water **Business:** Regional monopoly of water and/or wastewater networks in the U.S. **Business type:** Regulated **Key Disadvantage:** Only regional footprint with limited scope for growth beyond organic investments. Scarce asset in a country where c.90% of water and wastewater networks are in public hands (mostly municipalities).

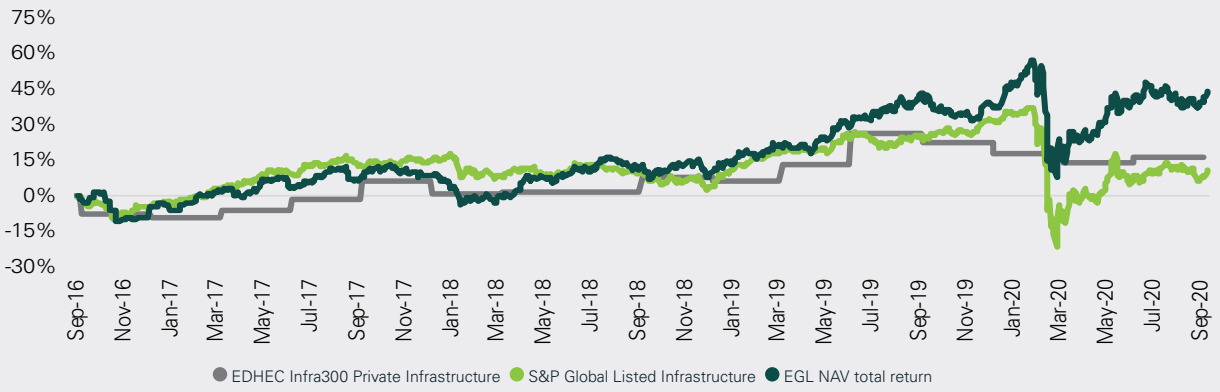
Source: Ecofin

Feature 4: Greater scope for alpha generation

It should be noted that whereas private infrastructure has historically achieved superior returns on average, higher liquidity and potential for diversification mean that the broad listed infrastructure segment should offer portfolio managers greater scope to add value. In the context of private asset ownership, where portfolio construction can depend on which assets are available to purchase at the time capital is being deployed, and portfolio concentration around specific assets tends to be higher, scope for outperformance may often be limited over time.

The performance of the Ecofin Global Utilities and Infrastructure Trust (EGL) highlights this point. Since its inception in September 2016, EGL's NAV has outperformed the S&P Global Infrastructure Index (of listed securities) by just over 35 percentage points and EDHEC's Infra300 Index of private Infrastructure assets** by c.25 percentage points (as of June 2020), thanks to our strategy of investment in the listed securities of companies demonstrably committed to the energy transition and with fundamentally strong ESG credentials, and with a focus on capital preservation which has helped us avoid major pitfalls (PG&E, Centrica, Atlantia).

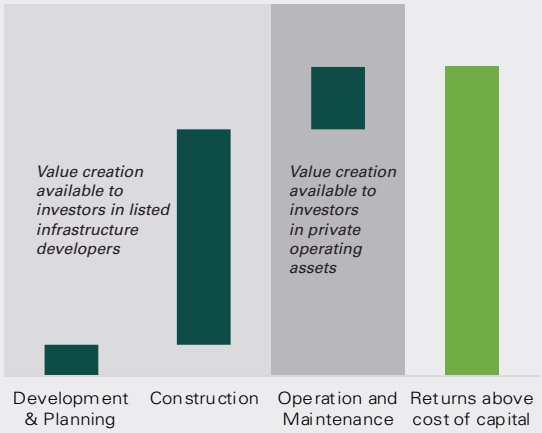
Chart 21: Global listed infrastructure offers ample scope for alpha generation (Cumulative total returns)



Source: Bloomberg, EDHEC Infrastructure Institute**

A fundamental reason for listed infrastructure potentially to compound higher returns over time is its ability to provide exposure to the full infrastructure value chain. Listed companies typically don't only own operating infrastructure assets – in most cases they also develop new ones. Having exposure to greenfield projects offers listed infrastructure companies the opportunity to deliver superior returns through operational expertise and efficiencies in the development and construction phases of a project. Indeed, as shown in chart 22, construction tends to be a determinant stage during which considerable value is either created or lost. Conversely, private infrastructure portfolios tend to focus on the ownership of operating (brownfield) assets, and there is relatively limited scope for return enhancement in the operation and maintenance of these assets.

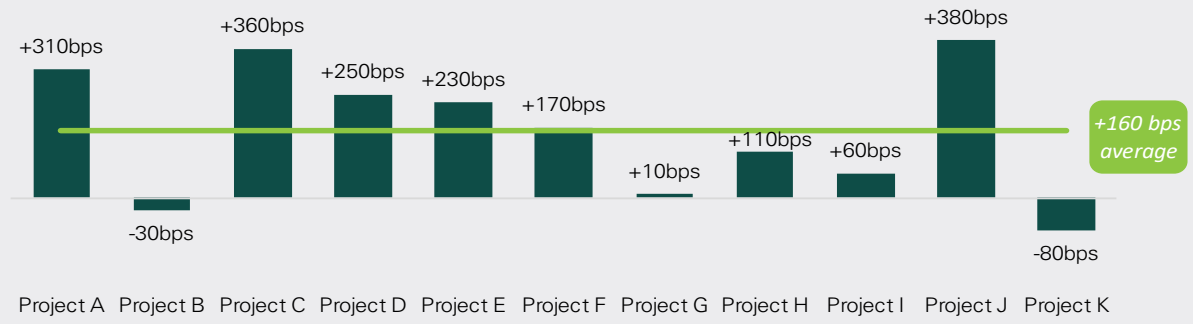
Chart 22: Listed infrastructure has greater scope for value creation



Source: Ecofin

An outstanding example is Danish utility Orsted, the world leader in offshore wind which has been able, through development, planning and construction excellence, to consistently deliver projects ahead of schedule and/or below budget. Orsted has enhanced returns for its eleven most recent offshore wind projects by 160bps on average compared to its initial expectations, a c.20% average improvement in project IRRs.

Chart 23: Greenfield projects offer significant value creation optionality (Unlevered project IRR enhancement post FID across selected projects)



Source: Orsted

Feature 5: More prudent financial structures

While investors often perceive listed infrastructure as riskier (than privates) due to stock price volatility, the intrinsically more prudent financial structures of listed infrastructure companies – and the resulting mitigation of risk for equity holders – is often disregarded. Listed companies generally need to comply with stricter metrics for their credit ratings, and self-imposed leverage targets often well below the rating thresholds in order to provide equity investors with additional comfort. Listed companies are continually incentivised to retain attractive credit ratings (and correspondingly low financing costs) given their need to periodically refinance debt as developers – as well as owners – of infrastructure assets.

Conclusion

There is a multi-decade upswing in economic infrastructure development, based on the needs of the modern economy and decarbonization priorities. Investors, we contest, should increasingly participate via listed securities which screen favorably on environmental criteria and provide important attributes such as liquidity, portfolio diversification and a broad opportunity set. These features should set the scene for listed infrastructure securities to close the valuation gap with private infrastructure assets.