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GLOBAL LISTED INFRASTRUCTURE

Understanding the pure infrastructure industry

TOPICS

Gaining a clear understanding of pure infrastructure

Economic and Social Infrastructure

Pure Infrastructure

- Pipelines & Storage
- Electricity Transmission
- Communication
- Transportation

<u>Growth of the listed pure infrastructure industry</u>

Performance of listed pure infrastructure

nfrastructure assets have provided the critical underlying structure to societies for centuries. However, as a distinct investment category infrastructure only really emerged from the beginning of 2009 onwards — just after the Global Financial Crisis. As banks were forced to deleverage under Basel III and governments were forced to constrain public-sector budgets, the supply of infrastructure capital reduced significantly. As a result, governments pushed for private infrastructure investments to stimulate economic growth and to renew current infrastructure assets. Subsequently, listed infrastructure investments gained momentum as institutional investors were seeking for new sources of returns in a climate of near-zero interest rates.

It is anticipated that as much as USD 57 trillion in global infrastructure investments will be required between now and 2030¹, part of which will be in listed vehicles. This calls for a deeper understanding of this relatively young and highly diversified asset class. In this paper the key characteristics of listed infrastructure and its purpose within a multi-asset portfolio are further explained.



Gaining a clear understanding of pure infrastructure

As governments are continuing the privatization of infrastructure assets, new investment opportunities arise. Especially in the listed infrastructure spectrum there is an increase in interest by institutional investors. This interest is encouraged by the fact that listed investments are able to provide similar benefits as unlisted and direct investments — with the added potential of greater liquidity and greater geographic and sectoral diversification. However, infrastructure includes a vast array of activities, each providing investors exposure to different risks, returns and cash flow expectations. To gain a clear understanding of pure infrastructure, it is essential to understand the differences between the activities within the different infrastructure industries.

Economic and Social infrastructure

Infrastructure is considered to be essential within day-to-day life and one of the major drivers for economic growth. Therefore infrastructure activities can be found in many different sectors and it is not always clearly defined what infrastructure activities entail. One of the distinctions often made is that of Economic versus Social Infrastructure.

Economic Infrastructure refers to the real assets that facilitate movement (of people, goods, information, etc.) thereby enabling economic activity. Within Economic Infrastructure there are a number of regulated and unregulated activities, as well as companies being either diversified or fully dedicated to infrastructure. Additionally, these companies generally enjoy a (quasi-)monopoly market positioning, resulting in stable and predictable cash flows.

On the other hand, Social Infrastructure refers to the assets that accommodate social services, such as healthcare, education and confinement. As the services are in most instances commissioned by governments, counterparty risk is low and cash flows tend to be regulated and dedicated to one essential activity. However, the assets accommodating Social Infrastructure activities should be considered real estate assets. Therefor Social Infrastructure should not be considered part of the pure infrastructure industry.

Economic Infrastructure assets can be grouped into four (4) distinct sectors: Energy, Oil & Gas, Communication and Transportation In the next pages these sectors will be further dissected to find the pure infrastructure activities.





Economic Infrastructure: Oil & Gas, Energy, Transportation and Communication

Typically, infrastructure companies operate in environments with little competition and low demand elasticity over the business cycle. This (quasi-)monopoly market positioning combined with demand stability and multi-year capital planning results in cash flows that are stable and predictable. To gain full exposure to these characteristics, only the companies that facilitate the movement of people, goods, energy and information by owning or operating a real asset should be considered. Every sector has its own distinct group of activities that can be described as 'pure infrastructure activities'.



Within the Energy and Oil & Gas sectors a majority of the companies generate, transport and sell energy. As these companies take ownership over the natural resources or service end-users/consumers, commodity risk and cyclical risk are high; even when certain (generating) activities are regulated. This exposure leads to considerable volatility in income, undesirable when investing in pure infrastructure. Hence, the focus should be on companies that only facilitate the movement. This implies that only transportation, transmission, storage and distribution activities are considered to be pure infrastructure. Most assets tend to be regulated, leading to inflation-linked income, and as contract durations are typically over 30 years in both the Energy and Oil & Gas sector, cash flows are stable and predictable.

The Communication sector consists of a variety of activities, ranging from the sales and marketing of telephone subscriptions, the broadcasting and transmission of telecommunication signals through fibre optics to owning and operating broadcasting towers or satellites. Companies that reflect the pure infrastructure characteristics, are the companies that facilitate the movement of information by providing broadcasting and transmitting capacity and/or hosting broadcasting systems. These companies own or operate either satellites or broadcasting- and mobile towers on which they offer capacity or rent out physical space to users. These users could be television- and mobile service providers. In general, pure Communication companies experience low competition as a result of government regulation, geographical coverage and high switching cost faced by tenants. Therefore contract durations tend to be long (typically > 10 years), resulting in environments with low capex requirements and high visibility on future earnings.

When looking at the Transportation sector a large number of companies is fully dedicated to the actual transportation of people, (consumer) goods and natural resources. In general these companies own, lease or construct vehicles to enable business. As these activities highly depend on the business cycle and the price of commodities, competition is high and income tend to be volatile. Therefore, the Transportation companies within the infrastructure industry are considered to be the companies that facilitate movement by owning or operating real assets. As such, the sector includes airports, sea ports, railways and toll roads. As these benefit from a (quasi) monopoly market positioning, contracts tend to be longer (typically 5 to 10 years), resulting in stable cash flows.



Pure infrastructure: Pipelines & Storage, Electricity Transmission, Transportation and Communication

When looking at the broad infrastructure market, it covers a vast array of activities that are essential within day-to-day life. However, many activities within this broad infrastructure market are not reflecting the desired characteristics for investors. Therefore, a conservative approach must be taken when gaining exposure to the pure infrastructure characteristics. This implies that one must only focus on the companies owning assets that facilitate the movement of people, goods, natural resources and information.

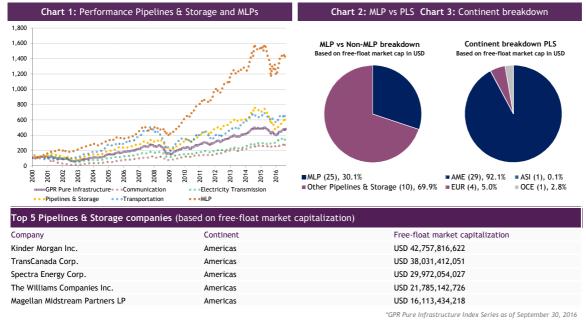
Following this approach, the focus should lie on the Economic Infrastructure sectors: energy, oil & gas, communication and transportation. Within these sector a number of pure infrastructure activities and their related risk-return profile can be clustered. This results in the following Pure Infrastructure sectors Pipelines & Storage, Electricity Transmission, Transportation and Communication. In order to gain a clear understanding of pure infrastructure, the related activities and the market developments, this paper will further elaborate on each sector.





Pipelines & Storage

The Pipelines & Storage sector relates to the networks storing and transporting natural resources, such as oil, natural gas and water. Typically these natural resources are extracted by upstream companies and transported to downstream companies. During these processes, Pipelines & Storage companies only facilitate the movement of natural resources without taking ownership of the resources. By excluding the companies that extract, produce and refine these resources, volume-, commodity- and price risks are limited. The companies within this sector predominantly have free-hold ownership of assets, resulting in indefinite cash flow streams. Combining these aspects with the long-term contracts forged with up- and downstream companies (typically having a duration of over 30 years), results in predictable and stable cash flows in the long term.



The growing importance of Master Limited Partnerships (MLPs)

In search for higher yields in low interest rate environments, a special interest of investors goes out to Master Limited Partnerships (MLPs). As offering distinct taxation characteristics, MLPs are able to provide higher cash yields compared to traditional interest rate driven securities and exposure to dedicated infrastructure assets. However, for certain investors MLPs involve several caveats, potentially leading to different returns than desired.

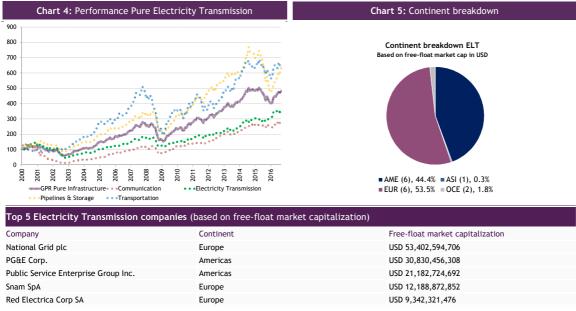
For instance, exposure to MLPs is only attainable by investing in the publicly-traded units issued by the partnership, This implies that equity investors invest as limited partners and therefore receive cash distributions rather than dividends when investing as corporate shareholder. As these cash distributions are partially or fully tax-deferred and treated as return of capital, overall yields are higher compared to dividend distributions. Apart from these aspects, MLPs enjoy pass-through taxation. As such, the partnership is not required to pay corporate-level taxes following United States federal tax law. Instead, taxes are paid on individual unitholder level, avoiding double taxation and thereby providing in higher cash yields.

However, most benefits can only be captured when a portfolio's assets held in MLPs is 25 percent or lower. In case these holdings are higher, an investment vehicle is forced to be structured as a regular corporation following United States federal tax law. Nevertheless, the number of MLPs and their respective market capitalization is growing and as the partnerships are able to benefit from the tax advantages, cash distributions remain solid and are able to grow further.



Electricity Transmission

The Electricity Transmission sector focuses on the companies that conduct long-haul transmission and short-haul distribution of electricity. This excludes sales and (regulated) generating activities, limiting exposure to commodity and price risks. Similar to the structures within the Pipelines & Storage sector, Electricity Transmission companies facilitate the movement of energy from electricity generating utilities to end-users. As the assets are in most instances regulated, the fees for transmission and distribution are not significantly impacted by changes in commodity prices. Apart from these characteristics, Electricity Transmission companies benefit from the growing interest in reducing carbon footprints, leading to an increase in natural gas assets and renewable energy. As these assets require additional infrastructure, investment opportunities in the listed spectrum arise.



*GPR Pure Infrastructure Index Series as of September 30, 2016

The revolution of renewable energy & natural gas

To provide reliable and affordable electricity, governments are pushing for more efficient and resilient electricity transmission networks to meet current and future demand. At the same time, governments are pushing for cleaner air and are willing to reduce carbon footprints. This, combined with the depletion of natural resources, pushed electricity generating utilities to actively diversify the sources of power generation from the turn of the century onwards.

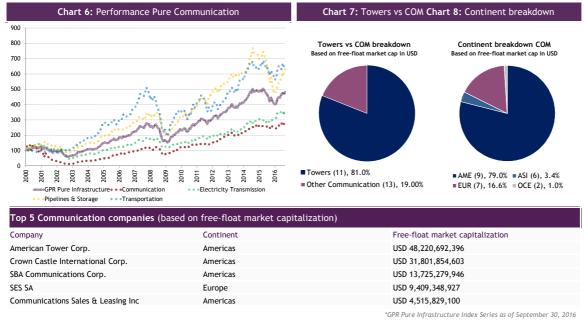
Meanwhile technological advancements within the Oil & Gas industry have led to an increasing importance of natural gas in the Americas as a result of hydraulic fracturing. Although the transportation of natural gas belongs to the Pipelines & Storage sector, natural gas is a low-cost substitute of coal for electricity generating utilities. Besides the cost advantage, natural gas provides more operational flexibility and efficiency compared to coal as natural gas-fired plants can be fired up and turned down more rapidly compared to coal-fired plants.

Combining these aspects with the fact that electricity generating utilities are enjoying strong financial backing by governments, leads to utilities starting to invest in new sources of electricity generation, such as solar and wind energy. For the Electricity Transmission sector this implies that new generation facilities are required to be connected to the existing electricity transmission networks, leading to new growth and investment opportunities.



Communication

Companies providing the movement of information by offering broadcasting and transmitting capacity and/or hosting broadcasting systems, are composing the Communication sector. This includes assets such as fixed-orbit satellites, broadcasting towers and fixed-line fibre optics that serve as the backbone for communication. As such, the sector excludes the activities related to end-users, for instance the sales and marketing of television- or mobile services. Typically Communication companies act in between service providers and end-users, where providers rent capacity from Communication companies to provide the actual service to end-users. Competition within the sector is low as a result of government regulation, geographical coverage and high switching cost for tenants. This tends to lead to long contract durations, resulting in environments with low capex requirements and high visibility on future earnings.



The fall and rise of global telecommunications and the data revolution

As a result of the Telecoms crash of 2001 — just after the Dot-com crash of 2000 — the Communication sector experienced a tremendous fall in performance. The fall was mainly caused by governments which auctioned licenses to the 3G radio spectrum. As the number of licenses auctioned by governments was limited and Communication companies could not miss out on the next technological advancement, competition was intense. This resulted in companies making high bids financed by large debts, increasing debt to asset ratios significantly. This, combined with the uncertainty of the Dot-com crash, eventually led to tumbling share prices.

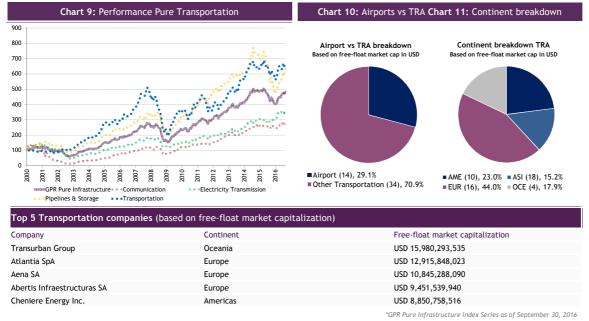
However, the industry recovered and competition between mobile network operators and wireless communication tower operators increased significantly. As a result, many communication infrastructure assets have been spun off from mobile network operators to communication tower operators. In turn, these tower operators were able to offer telecommunication services to multiple operators, resulting in a more efficient use of broadcasting towers and an increase in global coverage.

Simultaneously, demand for mobile data has increased significantly over the years by the use of notebooks, tablets and smartphones and their technological migration from second-generation (2G) to 3G, 4G and 5G mobile networks. However, the increased usage led to various congestions and disruptions, forcing tower operators to provide quality service to clients. This led to an increase in investment opportunities to both expand and upgrade the networks.



Transportation

The companies within the Transportation sector facilitate the movement of people and goods. This includes the owners and operators of airports, toll roads, bridges, seaports and railroads. However, the sector excludes the companies utilizing these assets, such as airlines, train operators and transporters, as these activities are unregulated and exposed to trade and commerce. Within Transportation certain assets are regulated and operated under long-term concessions. Yet, contracts tend to be short compared to other infrastructure sectors (typically 5 to 10 years) and most companies derive their income from multiple regulated and unregulated activities. These diversified revenues have historically resulted in higher, but more volatile returns. The majority of the unregulated revenues are derived from real estate and retail activities, increasing exposure to the economic cycle, but enhancing overall yield.



Airports with shops or shopping centres with wings?

Retail activities within airports have an increasing importance to the P&L of an airport. As transfer passengers are forced to stay within a specific terminal for 1.5–2 hours between flights (dwell time) and often in a good mood to spend, retailers are eager to provide their offerings within these terminals. Combining this aspect with the limited space available, results in firm retail rents and a high 70–80 percent EBITDA margin on the retail activities². However, retail income is unregulated and tend to be cyclical and volatile compared to pure infrastructure income. This cyclicality is further underlined by the dependency on the number of passengers, which in turn is influenced by airliners.

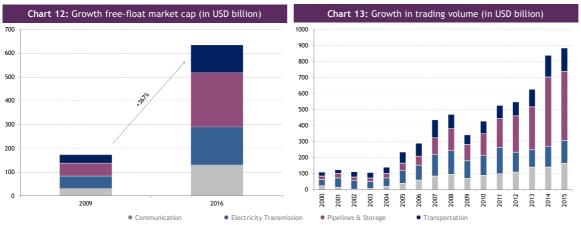
Apart from the retail revenues, airports have ownership over certain parcels of land and derive revenues from parking and real estate activities. Nevertheless, the overall profitability of these activities all depend on the success of the (regulated) airport activities. More passengers result in more aviation revenues, but also in more unregulated revenues.

The combination of both regulated and unregulated activities results in a diversified income stream, unique within the infrastructure universe. Subsequently, this is companioned by a different risk-return profile compared to other infrastructure sectors, where the volatility has been considerably higher. This, however, resulted in a higher overall performance.



Growth of the listed pure infrastructure industry

Infrastructure, as being a distinct investment category, emerged after the Global Financial Crisis. Governments faced public-sector budget constraints and banks were forced to deleverage under Basel III. This led to a significant reduction in infrastructure capital. However, governments started to push for private infrastructure investments in 2009 to upkeep economic growth. This push was achieved by increasing the privatization of infrastructure assets, leading to numerous private investment opportunities through listed, unlisted and direct investments. Initially, investors preferred to gain exposure to infrastructure through unlisted or direct investments due to the greater control and the ability to invest large sums of capital at once. However, listed infrastructure provided many similar benefits, while providing the potential for greater liquidity and greater exposure to regions and sectors. This led to an increasing interest for global listed infrastructure.



*GPR Pure Infrastructure Index Series as of September 30, 2016

From a government and corporate perspective, the listed market offered numerous opportunities to attract new capital, especially after the Global Financial Crisis. As can seen in Chart 12, from this period onwards, free-float market capitalization more than tripled from over USD 172 billion in March 2009 to over USD 635 billion in September 2016. All sectors saw growth of free float market cap of over 200 percent. The largest absolute and percentage growth was seen in the Pipelines & Storage sector, which increased with USD 173 billion, representing a growth of 321 percent.

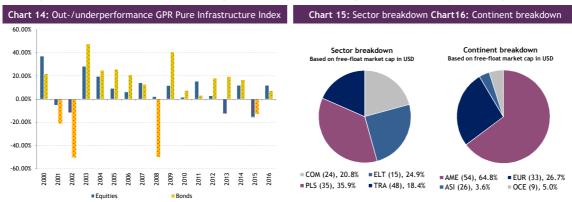
In search for stable revenues and returns in a climate of near-zero interest rates, investors found listed infrastructure as the investment opportunity that was able to provides strong returns and high liquidity within an otherwise illiquid asset class. Compared to direct and unlisted infrastructure investments, listed infrastructure was able to provide liquidity, high levels of disclosure and strong diversification potential. Therefore investments in listed infrastructure increased significantly. This development can be seen in Chart 13, where the annual trading volume increased by more than 258 percent in the period from 2009 to 2015. Especially trading volumes within the Pipelines & Storage sector increased significantly (422 percent), partly due to the growth of MLPs, followed by the Communication sector and Transportation sector, with 231 percent and 247 percent respectively.

As first being part of a generalist portfolio, over the year infrastructure has developed itself into a distinct investment category. Currently there is seen a large number of dedicated real assets and infrastructure portfolios. This is seen within multi-asset class portfolios of institutional investors, where infrastructure has gained an increasingly important role. Compared to unlisted infrastructure, listed infrastructure is able to provide similar benefits as unlisted and direct investments, but with the added potential for greater liquidity, lower fees and greater geographic, regulatory and industry diversification.



Performance of listed pure infrastructure

As infrastructure developed itself into a distinct investment category, it gained an increasingly important role within multi-asset class portfolios of institutional investors. The exposure to tangible assets that facilitate essential services to society, tend to ensure stable and predictable income — regardless of economic weakness. Therefore it might come to mind that the return profile of pure infrastructure companies should be lower than companies with more exposure to the business cycle. However, when comparing global listed infrastructure with Equities (MSCI) and Bonds (JP Morgan) (Chart 14), global listed infrastructure has gained significant outperformance while experiencing lower volatility than Equities (Chart 17). Especially during and after volatile periods, e.g. Dotcom crash and Global Financial Crisis, global listed infrastructure provides higher returns, while incurring less volatility compared to Equities.



rt 17: Risk/F	Return Infrasi	tructure, Eq	uities & Bond	ds			
INFRASTRUCTURE							
EQUITIES INFRASTRUCTURE INFRASTRUCTURE A							
•	BONDS A FOURT	IES 🛑					
5%	10%	15%	20%	25			
		41	FRASTRUCTURE 🛕				
			EQUITIES				
GFC (Jan 2000 –	Oct 2007)	GFC Recove	ry (Mar 2009 – Ju	ın 2012)			
(Oct 2007 – Mar	2009)	• Post GFC (J	un 2012 — Aug 20	16)			
	BONDS BONDS 5%	BONDS INFRASTRUCTURE E EQUIT BONDS BONDS EQUIT	INFRASTRUCTURE BONDS INFRASTRUCTURE BONDS BONDS BONDS FQUITIES BONDS 10 FRASTRUCTURE FQUITIES BONDS 10 FRASTRUCTURE FOR	BONDS INFRASTRUCTURE DEQUITIES BONDS BONDS COUNTIES BONDS BONDS PROME POUNTIES 5% 10% 15% 20% INFRASTRUCTURE POUNTIES FOUNTIES POUNTIES GFC (Jan 2000 — Oct 2007) GFC Recovery (Mar 2009 — July			

		Equities	Bonds			
Infrastructure	PURE	0.74	0.44			
	COM	0.66	0.31			
	ELT	0.35	0.56			
	PLS	0.56	0.30			
	TRA	0.83	0.37			
COM: PURE Communication Index		PLS: PURE Pipelir	PLS: PURE Pipelines & Storage			

Table 1: 3 year Correlation Infrastructure, Equities & Bonds

ELT: PURE Electricity Transmission TRA: PURE Transportation

*GPR Pure Infrastructure Index Series as of September 30, 2016

In addition to the strong performance and favourable risk-return ratios of global listed infrastructure, the broad exposure to regions and sectors provides investors the opportunity to further diversify an investment portfolio and thereby improving the risk-return trade-off. This is further emphasized by the low correlation to Equities and Bonds (Table 1).

A wide variety can be seen in the correlations between Equities and Bonds and the four sectors. Correlation between the Transportation sector and Equities has been relatively high (0.83), where the Communication and Pipelines & Storage sectors show similar results. The Electricity Transmission sector stands out as being more correlated to Bonds than to Equities.

Historically, the strong returns and lower volatility compared to other investments and low correlations have resulted in global listed infrastructure being able to provide attractive risk-adjusted returns, thereby enhancing the efficient frontier of a multi-asset portfolio.



About the GPR Pure Infrastructure Index

The GPR Pure Infrastructure Index consists of 122 global listed infrastructure companies, representing a free float market capitalization of over USD 635 billion. Apart from the index's strong performance, the broad exposure to regions and sectors provides investors the opportunity to further diversify an investment portfolio and thereby improving the risk-return trade-off. For instance, the sectors within infrastructure offer a wide variety in correlation to Equities and Bonds. This variety has resulted in a risk/return profile that has provided strong outperformance over both Equities and Bonds during economic upcycle and limited underperformance during economic down cycle. Historically, the strong returns and lower volatility compared to other equity investments have resulted in infrastructure being able to provide attractive risk-adjusted returns, potentially enhancing the efficient frontier of a multi-asset portfolio.

Companies included in the GPR Pure Infrastructure Index are required to obtain at least 50 percent of operational turnover from pure infrastructure activities, i.e. facilitating the movement of people, goods, natural resources and information, by owning or operating the real asset. Besides this, companies must have a minimum free-float market capitalization of USD 100 million.

GPR Pure Infrastructure Index									
Geographic	GPR Pure Infra Americas Index		GPR Pure Infra Europe, Middle East & Africa Index		GPR Pure Infra Asia-Pacific Index				
	GPR Pure Infra Americas Index		GPR Pure Infra Europe Index	GPR Pure Infra Africa Index	GPR Pure Asia Inde	1	GPR Pure Infra Oceania Index		
	GPR Pure Infra COUNTRY Index								
_	GPR Pure Infra Developed Index			GPR Pure Infra Emerging Index					
Diversification	GPR Pure Infra MLP Index			GPR Pure Infra ex MLP Index					
	GPR Pure Infra Pipelines & Storage Index			GPR Pure Infra Transportation Index		GPR Pure Infra Communication Index			

Constructing bespoke benchmarks: Customization possibilities

Over more than 20 years, GPR has been able to gain know-how on the construction and maintenance of (bespoke) property benchmarks. By extending this know-how with the GPR Pure Infrastructure Index Series, GPR again demonstrates its dedication and specialization in the provision of standard and customized benchmarks.

Apart from the standard indices, GPR is fully capable to tailor indices to specific client's and needs. Examples of these needs are the in- or exclusion of specific stocks, sectors or countries, imposing weight capping's or the hedging currency risks. By working together with clients, GPR is able to ensure that the benchmark will perfectly reflect the investment strategies of clients.

All indices are available in price and total return versions and are calculated in AUD, EUR, LOC and USD. The GPR Pure Infrastructure Index Series is distributed via our website www.globalpropertyresearch.com, Bloomberg (GPRI <GO>) and Reuters (0#.GPRINFRA).



Contact us:

Please contact Global Property Research (GPR) to get more information on the GPR Pure Infrastructure Index and other benchmarking possibilities.

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IMPORTANT DISCLOSURES

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¹ Dobbs, R., Pohl, H., et al. (January 2013), "Infrastructure Productivity: How to Save \$1 Trillion a Year", McKinsey Global Institute, © McKinsey & Company.

² van der Meij, T., Maynadier, C., (July 2015), "European Airports - Flying high", Kempen & Co Securities, © Kempen & Co.