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## Building an infrastructure portfolio

Partners Group Research Flash March 2012



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## Building an infrastructure portfolio

### EXECUTIVE SUMMARY

Infrastructure is still a nascent asset class with many investors drawn to it through its perceived attractive characteristics such as low correlation to broader economic cycles, strong capital preservation, attractive risk-adjusted returns including a significant yield component and inflation protection. However for many early investors, the asset class has not delivered the promised consistent and non-cyclical returns. This outcome is often the result of sub-optimal portfolio construction not suited to the asset class and specifically of over-concentrating allocations across various relevant risk dimensions in infrastructure such as number of assets, sector, region and/or stage.

This paper will argue that the specific nature of infrastructure returns, namely a non-standard return distribution characterized by a fat left tail and a high proportion of non-systematic risk requires a conscious and systematic approach to portfolio construction. It will specifically focus on the importance portfolio construction plays in achieving the investor objective in infrastructure of consistent total returns and recurring yield with little sensitivity to the economic cycle.

Understanding the underlying risk characteristics of infrastructure investments and appropriate diversification across different sets of risks is central to this approach. In private markets however, this approach is far from straight forward to implement. It requires not only a deep understanding of the risks inherent in different infrastructure assets but also the ability of investment managers to originate a sufficient number of actionable quality investment opportunities in order to build a portfolio in a reasonable amount of time and independent of the market cycle. For instance, one of the implications of the significant tail risk exposure of returns in core, brownfield infrastructure assets is that an investor should add a proportion of projects with greenfield exposure to his portfolio. Similarly, in order to be able to access the market during times of capital constraint and avoid vintage year concentration, an investor should have the ability to add secondary investments to their portfolio.

Separately, for many investors, inflation protection is one of the key attractions of investing in infrastructure. However, inflation linkage is not always explicit in infrastructure assets. In order to achieve the desired real asset characteristics of an infrastructure portfolio, it is therefore necessary to carefully analyze how inflation will affect a specific investment. Understanding the impact of different drivers of inflation sensitivity such as regulated tariffs, contractual indexation, pricing power and replacement value considerations will determine how immediately an infrastructure portfolio will react to changes in inflation and consequently the inflation protection it offers. Further, it is also necessary to carefully consider the embedded inflation assumptions built into the valuation of infrastructure assets and compare them to prevailing and expected future inflation rates in the market in order to avoid overpaying for inflation protection through aggressive assumptions embedded in the investment case.

In conclusion, Partners Group believes that a portfolio construction approach based on the specific nature of infrastructure returns has substantial benefits for the investor by improving the risk/return relationship of a private infrastructure portfolio and by increasing the probability the investor's objectives of generating stable and defensive returns with a significant yield component are met.



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## 1. INTRODUCTION

The continuing volatile macro-economic backdrop and record low real yields for safe assets have resulted in growing interest by investors in asset classes that can generate stable performance whilst still producing desirable yields. Consequently investors have increasingly focused on the infrastructure asset class due to its perceived attractive characteristics, such as low correlation to broader economic cycles, strong capital preservation, compelling risk premiums over government bonds and inflation protection, which are especially relevant in the current low growth environment with significant long-term risks to price stability from very easy and unconventional monetary policy. Against this backdrop, objectives of investors for the asset class are typically twofold; firstly, it should deliver a consistent performance of several hundred basis points above the risk-free rate achieved through operating yield and limited/moderate capital growth with a low value at risk (or downside risk). Secondly, the portfolio of assets should exhibit significant positive inflation correlation and protect the portfolio from unexpected inflation not embedded in the investment assumptions (unlike bonds).

However, for many early investors into the asset class, performance outcomes have not met the above objectives due to a variety of factors relating to a combination of either portfolio construction reasons (e.g. investment manager/vintage year concentration) or asset specific issues (e.g. mispricing of regulatory risk, overleverage, assumptions over demand risk etc.). The main reason for this is that private market investors tend to emphasize the fundamental and - in the case of infrastructure - defensive characteristics of the individual assets they acquire (i.e. "stock picking" or bottom-up approach) and pay less attention to the role of portfolio construction (i.e. the interaction or correlation between portfolio assets) as a driver of the portfolio risk/reward relationship. Public market investors on the other hand often tend to do the opposite and focus on portfolio construction through a statistical analysis of the portfolio's projected returns but with little analysis of the fundamental risk/return drivers of each underlying company. Partners Group believes that by focusing on the individual asset perspective private market investors forgo substantial benefits that a more targeted portfolio construction process can bring.

The remainder of this paper discusses the key criteria that Partners Group believes that investors should focus on in relation to 1) portfolio construction, 2) portfolio implementation and 3) inflation protection.

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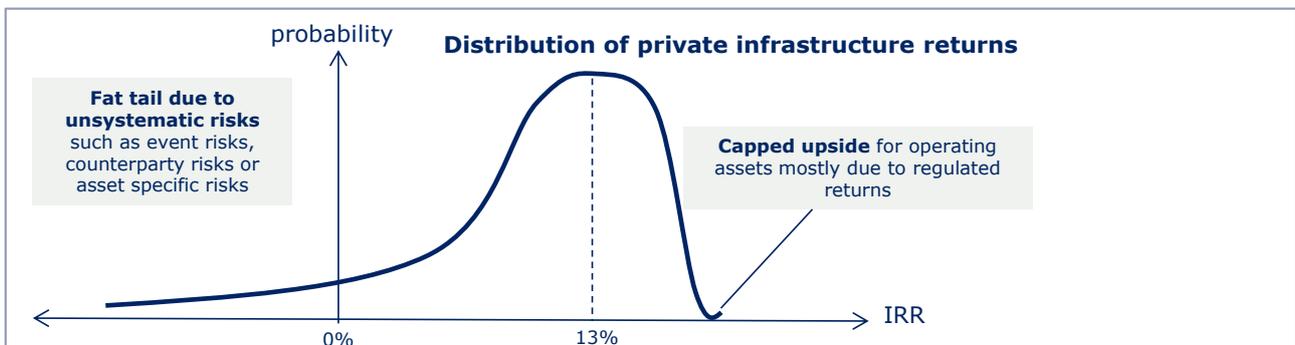
### 2. PORTFOLIO CONSTRUCTION

Classic portfolio theory postulates that optimal portfolio construction is a function of i) the probability distribution of returns, ii) a single asset's risk/return relationship and iii) the interaction of portfolio assets in a portfolio measured by the correlation of returns.

#### i) THE PROBABILITY DISTRIBUTION OF RETURNS

As can be seen in the illustrative chart below, Partners Group believes that returns in (core/brownfield) infrastructure are characterized by a non-standard return distribution. This view is derived from our understanding of the nature of returns generated from infrastructure assets such as 1) capped upside to most brownfield infrastructure investments given the typically regulated returns, and 2) the non-symmetric downside risk ("fat left tail") caused by infrastructure specific unsystematic risk, which, especially when combined with high leverage levels, further amplifies the downside risks to equity (as shown in the diagram below). This has important consequences for portfolio construction, namely that the upside of any investment is effectively capped while downside risk remains significant. Consequently, a private infrastructure investor should follow a portfolio management approach that is somewhat analogous to credit portfolio management rather than an equity portfolio and portfolio construction should reflect this. This theme will be explored more thoroughly in the subsequent section on "Implications for portfolio construction in practice".

#### Exhibit 1: Non-standard return distribution



Source: Partners Group estimates. The return estimates are purely an estimate of typically observed infrastructure returns

#### ii) A SINGLE ASSET'S RISK/RETURN RELATIONSHIP

Understanding the risk/return profile of infrastructure investing is crucial to constructing an optimal portfolio of assets. As shown by the graph above, there is a significantly longer tail to the left of the mean in the return distribution. When analyzing risk in infrastructure, Partners Group focuses on four categories of risk drivers:

##### Counterparty risk

One important aspect of core infrastructure investments is that they transform certain risk,

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notably volume and pricing risk, into credit risk. For example, the primary obligation of a power plant with a well-structured long term power purchase agreement ("PPA") with an utility is often to be available to produce power if needed by the utility. Should it be available, it will be able to pass through its variable cost of operation to the utility and receive a fixed capacity payment for its availability. This type of structure eliminates dependency on volume and pricing which a merchant power plant would face. However, price and volume risks have not disappeared, they have simply been transferred to another party. The "infrastructure" power plant has exchanged these risks for counterparty risk and is dependent on the off-taker to honor its commitments under the PPA. Of course, infrastructure companies are not unique in being exposed to counterparty risk as most businesses are also exposed to counterparty risk. What is unique about infrastructure businesses however is that they often face long-term concentrated counterparty risk compared to other businesses (which typically have many customers spread across the globe). The reason for this is that most infrastructure businesses have assets that are immobile and hence cannot significantly diversify their customer base. However, as it is also a risk unique to a specific asset, investors can address this risk on the portfolio level.

Whilst the default risk is typically quite remote given the often high credit quality of the typical counterparty, the counterparty (credit) exposure creates the left tail of the return distribution described in Exhibit 1.

### Event risk

Event risks are another central risk for infrastructure assets given the potential for significant losses with limited ability to compensate for them through out-sized returns. For instance, an important set of event risks in infrastructure are political or regulatory changes. Perhaps the most recent example of note is the retroactive change related to the solar feed-in tariff in Spain in 2010. Another example are the increasingly strict power plant emission standards being introduced by the US Environmental Protection Agency which will likely require new pollution controls to be installed by existing generators where it is not clear if they will be able to pass through these incremental costs. While not completely impossible to predict or anticipate, the timing or scale of impact of political and regulatory changes remain significant unknowns for the investor. With respect to the impact of political and regulatory risks on infrastructure investments, Partners Group believes that there are three main points to consider: 1) these risks are less correlated across countries/regions than the economic cycle, suggesting greater benefits of diversification in infrastructure given the idiosyncratic nature of these risks, 2) the main difference with infrastructure businesses versus other regulated industries (e.g. banking, pharmaceutical) is that infrastructure assets cannot be easily moved to avoid regulation as is the case with some other businesses (e.g. financial services businesses such as hedge funds), and 3) the consequences of an adverse change are more severe in infrastructure as infrastructure assets require large upfront capital expenditure that requires long payback periods and is immobile post investment. In economic terms, this capital expenditure is considered a sunk cost. Again the specific nature of event risks on infrastructure assets has to be addressed on the portfolio level as it is a risk that cannot be mitigated on the asset level.

### Asset/project specific risk

Asset specific risks in infrastructure can range from environmental risk to operational risk to demand risk. For instance, in relation to environmental risks, while insurance coverage can protect against some of the impact related to large events such as hurricanes or earthquakes, assets are often still left partially exposed. Less severe environmental conditions can also lead to more severe impacts on renewable energy investments. In particular, solar and wind

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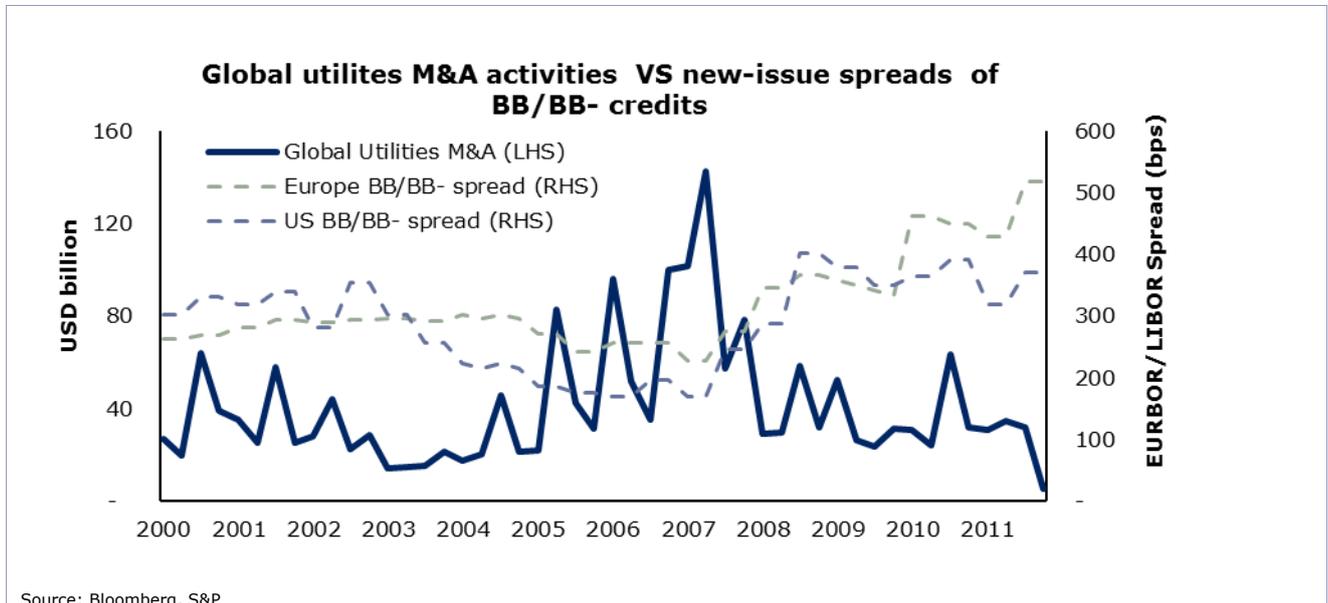
investments are generally completely exposed to the amount of solar/wind resources. In relation to the operational risk of infrastructure investments (e.g. a mechanical problem in a production plant), these risks can have a significant impact to equity holders unless appropriate insurance or “pass through” contracts have been negotiated. However these operational asset risks tend to have a very low correlation to each other on a portfolio level. For instance, solar and wind hours have very little correlation to each other and further across different geographies, whilst mechanical problems at a water company do not impact the likelihood of unexpected repairs at an airport. Demand risks are often seen as a feature of transportation infrastructure. For example, there are two common structures for toll road concessions – availability based concessions and demand based concessions. Availability-based concessions provide for payments based strictly on whether or not the road is available for use, whereas demand-based concessions provide for owners to receive their return based on the actual usage of the road. As such, demand risk will likely cause little impact to an availability-based toll road but have a significant effect on a road operating under a demand-based concession with the consequence that an investment in a demand-based toll road will typically provide a higher return to compensate the investor for the systematic or market risk that he faces. While asset risks are diversifiable risks, as the name implies, they are not specific to the infrastructure asset class. However the often higher leverage in infrastructure can result in more significant impacts for equity holders.

### **Systematic risk**

While infrastructure returns are typically less correlated to the economic cycle than other asset classes, there still remain elements of correlation to the economic cycle. The impact of the economic cycle on infrastructure assets is not so much derived from changes in cash flows of the assets (as these usually have an element of contractual obligation) but rather from the impact of cyclical changes in required discount rates on asset values. In infrastructure this is namely the change in the real rates in the economy. Investors will demand (and typically receive) a return from the market in exchange for taking this risk but it is, by definition, a non-diversifiable risk faced by all investors although investors in infrastructure will benefit from being less correlated to changes in growth compared to other asset classes. A specific challenge private market investors face in this respect, is that their ability to deploy capital in the infrastructure market is inversely correlated with movements in discount rates. As can be seen in Exhibit 2, global M&A volume in utilities (the largest segment in infrastructure) was particularly high in a period of low credit spreads (used as a proxy of discount rates) which implies that a lot of equity was invested in periods of high valuations while M&A volumes are much lower in the current period of high credit spreads. As most private infrastructure investors have started allocating to the asset class in recent years, they have directly or indirectly deployed most of their capital in periods of high valuations while they are lacking exposure to the years where discount rates were at much more attractive levels (albeit risks may be higher too).

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**Exhibit 2: Global utilities M&A activity versus credit spreads**



To avoid portfolio allocation becoming overly exposed to peak valuation vintages, a private markets portfolio strategy needs to pro-actively seek out investment strategies and market segments that allow the deployment of capital in more difficult environments. The market for secondary portfolio interests is a good example of a market where volumes are countercyclical to the M&A cycle and can provide investors with the opportunity to diversify their portfolio across different vintage years.

iii) INTERACTION OF PORTFOLIO ASSETS IN A PORTFOLIO MEASURED BY THE CORRELATION OF RETURNS

The challenge in the context of the private infrastructure asset class (or indeed any private asset class) is that the returns cannot be empirically observed in private markets in sufficient frequency and quality to calculate the covariance matrices which are typically used to optimize portfolios. So while public market techniques to build optimal portfolios cannot be applied in a private market context, a granular understanding of the risk drivers for different infrastructure assets still allows the investor to apply the basic tenet of portfolio theory, namely to diversify the portfolio and to reduce non-systematic risks which are not compensated by the market and hence improve the risk/reward relationship of the portfolio. As we described in section ii) above, typical private infrastructure assets carry a high proportion of idiosyncratic risk as part of their total risk, which suggests that there are strong benefits from diversification. This is actually counter to the observation that most private infrastructure investors have fewer assets in the portfolio than in private equity. The next section will now look at the practical implications for the portfolio allocation of private infrastructure portfolios.

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### 3A. IMPLICATIONS FOR PORTFOLIO CONSTRUCTION IN PRACTICE

In order to build an optimal private infrastructure portfolio, Partners Group believes that practical choices on five allocation parameters are relevant for investors:

#### Stage allocation

Most infrastructure investors have a strong preference for operating (brownfield) assets due to their desire for lower risk investments and yield. However, returns of brownfield investments typically exhibit the strong credit-like left skew in their return distribution discussed previously. In contrast, Partners Group is of the opinion that an allocation to a portfolio of greenfield/construction projects in the order of 20-25% of the overall infrastructure portfolio is beneficial for the risk/reward relationship of the portfolio for a number of reasons: i) greenfield/construction projects help to balance the left skew of a brownfield portfolio as they have an inherent upside as the project is de-risked once it is completed and successfully put into operation; ii) to carry the higher risk of taking a project from construction to operation, investors get compensation through higher project level IRR's. Given the highly idiosyncratic nature of the incremental risk of a greenfield project (i.e. mostly construction and/or counterparty risk), building a portfolio of such projects adds incremental return to the portfolio without significantly increasing the overall risk, and iii) greenfield projects offer a tangible active return opportunity for the skilled investor to add value beyond the asset class return through securing attractive projects, structuring them appropriately and attracting quality counterparties. In terms of implementation, Partners Group will often partner with local and/or sector specialists given the highly specialized nature of greenfield projects. It will also focus on construction-stage projects and not development/permitting activities and emphasize greenfield/construction investments in sectors with manageable construction times and risks (e.g. renewable energy and social infrastructure). In summary, we believe that an allocation to greenfield projects represents one clear way to capture a systematic return premium in private infrastructure.

#### Country allocation

Given the highly regulated business of many infrastructure assets or their direct dependence on the government as an off-taker, the assessment of country risk plays a crucial role in infrastructure investments. This is especially relevant in today's macro environment where the ability to support and/or pay for infrastructure projects has deteriorated in many countries, most notably in Europe but also in general across the developed world. Again, the more idiosyncratic nature of individual governments intervening in the infrastructure sector suggests a broad diversification across countries can help to reduce this risk and optimize the portfolio risk reward relationship. There are also two other reasons that make it advisable in our opinion to seek broader country diversification. Firstly, infrastructure investments are typically made with a long-term investment horizon which makes the assessment of political and regulatory risk inherently more difficult and, secondly, these are risks outside of the control of the investor and cannot be addressed through active management suggesting a larger benefit to diversification. Partners Group reflects this view in an allocation of typically 20-30% to rest of the world outside Western Europe and North America.

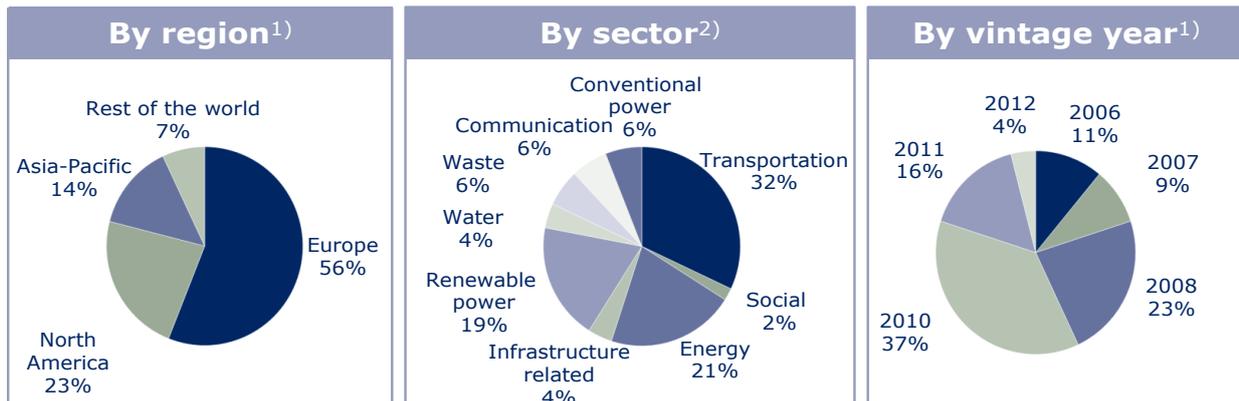
#### Sector allocation

Partners Group believes that sector allocation (as shown in Exhibit 3) is less crucial in infrastructure compared to private equity as many infrastructure sectors are less globally integrated and more driven by country specific factors such as the regulatory framework as discussed above. Sector allocation does however play an important role in defining a portfolio's

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exposure to demand risk and indirectly the economic cycle with transportation assets such as ports, airports and toll roads exhibiting relatively high sensitivity while regulated utilities and social infrastructure exhibit little sensitivity.

### Exhibit 3: Region, sector and vintage year diversification of infrastructure program



Source: Partners Group as of 30 November 2011; Note: <sup>1)</sup>based on commitments; <sup>2)</sup>based on NAV

Infrastructure program refers to Partners Group Global Infrastructure 2009, L.P.

### Single asset weights

Partners Group typically allocates only 2-3% of its portfolio to a single asset. Avoiding portfolio concentration is the most effective way to mitigate the impact of inherent tail risk exposure in infrastructure as discussed in detail above. To do this effectively, it is important to carefully understand the underlying exposure to build a portfolio that is truly resilient. For instance, a renewable asset under a government-supported tariff system represents a significant exposure to the subsidy embedded in the tariff irrespective of whether the government funds this subsidy directly or if it is paid by users. Buying additional renewable assets in this country does therefore little to improve the diversification of the portfolio as it will only reduce the exposure to project specific risks while at the same time increase the exposure of the portfolio to the tail risk of changes in the tariff system.

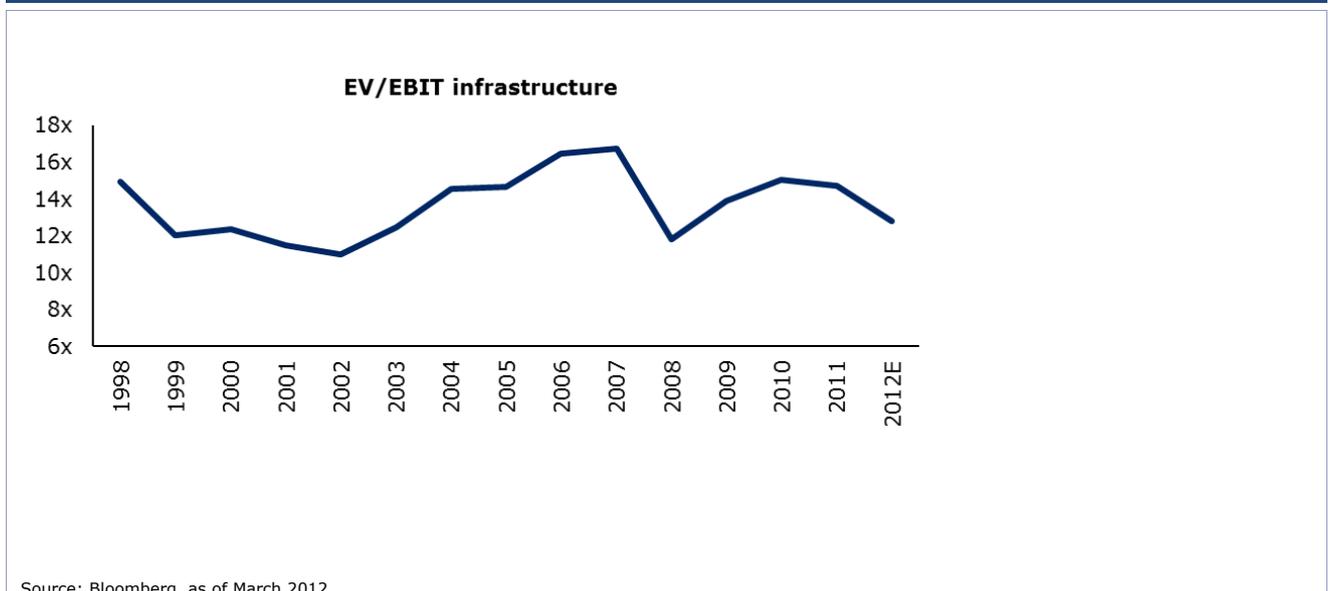
### Vintage years

Any private market strategy represents a long-term strategy. Beyond this timing dimension there is in addition an access dimension as investors need to be able to identify and execute on sufficient quality investment opportunities. The latter point is particularly important in infrastructure as asset availability is lower than in other private market categories such as private equity or private real estate. Investors therefore need a clear strategy how to build and maintain their private infrastructure exposure over time. Beyond being a practical challenge, diversifying the portfolio across vintage/investment years is also highly relevant for the long-term performance outcome of the portfolio. This is due to the impact changes in real rates have on the valuation of infrastructure assets (and particularly equity) as can be seen in Exhibit 4 below in combination with the volatility real rates exhibit over time. Partners Group therefore targets a consistent investment pace over time to avoid concentration in high

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valuation vintage years. As investment activity is pro cyclical (as shown in Exhibit 2), the investor has to address this bias within his strategy. As an example, one market segment Partners Group pro-actively uses to achieve a more balanced investment pace is the purchase of single or portfolios of assets on the secondary market. For instance, through the use of secondary transactions in 2009, Partners Group was able to acquire existing portfolios of assets from earlier vintage years while profiting from the very low valuation environment at the time. Given the lack of new fundraising activity or new direct transaction activity during this year, an investor not considering secondaries would have missed out on this opportunity. In addition, Partners Group uses a systematic relative value process to assess and identify market areas that offer a particularly attractive risk adjusted return at a given point in time as a means to add value to its portfolios beyond a passive strategy.

### Exhibit 4: Global infrastructure valuations over the last 10 years



### 3B. CAPACITY TO IMPLEMENT

No matter how important an effectively diversified portfolio is to achieve consistent and defensive performance, actual implementation will ultimately depend on the investor's ability to find and execute on enough attractive investments to build such a portfolio. And this in turn depends on two key steps of the investment process, namely a) origination capacity and b) analysis and execution skills. Neither of these two aspects are specific to private infrastructure, but the way an investor goes about them needs to address the specific circumstances of the infrastructure market.

In terms of deal flow origination, Partners Group focuses on creating a broad and diverse opportunity using the following tools:

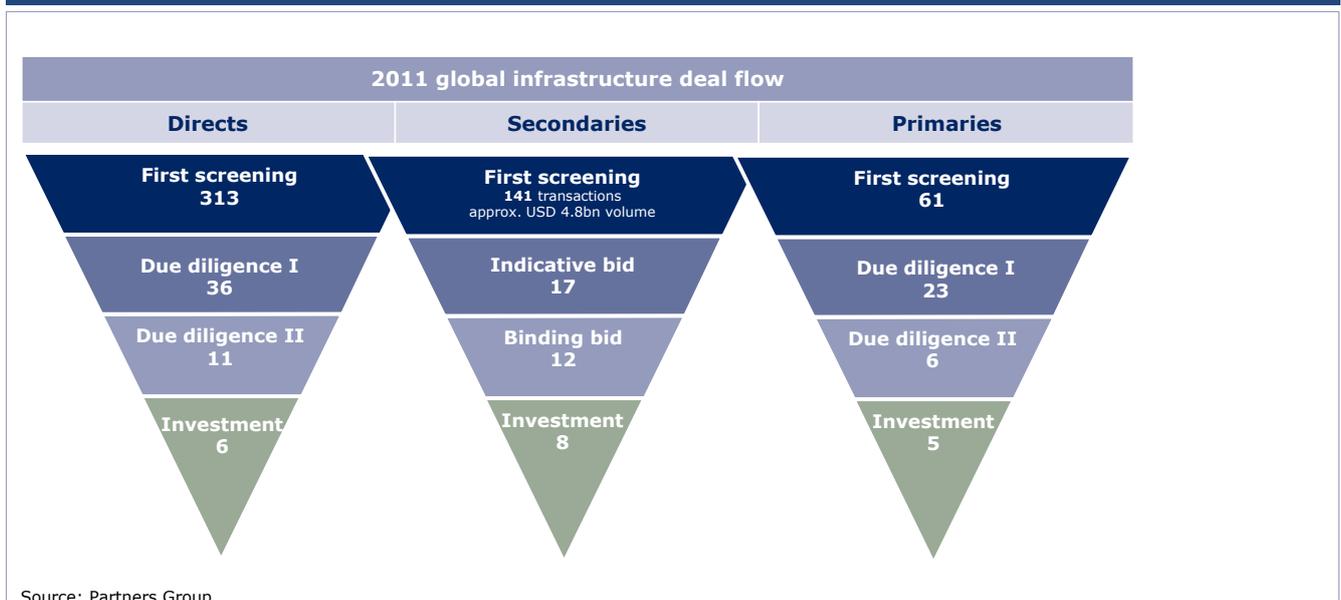
- A local network and presence across the globe as many attractive opportunities are with local and/or sector specialists
- Building relationships with operators, contractors, developers to gain access to a broader opportunity set of transactions

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- Consideration of investment across different stages (e.g. greenfield or brownfield) allowing the investor to broaden the opportunity set and look for active return opportunities
- Consideration of investments in different instruments (e.g. equity, subordinated debt) within the capital structure as relative attractiveness varies over time
- Expanding the opportunity set by considering investments in emerging markets that offer sufficient ability and willingness (in terms of regulatory framework and corporate governance) to develop and pay for infrastructure
- An integrated investment approach combining direct investments, the purchase of single or portfolios of assets on the secondary market complimented by primary fund commitments

As can be seen in Exhibit 5 below, Partners Group has screened more than 500 transaction opportunities in 2011 and closed on 19 transactions. This is the level of deal flow Partners Group thinks is required to allow the timely implementation of a true global portfolio approach in a private market environment.

### Exhibit 5: 2011 deal flow in private infrastructure



It is not the purpose of this paper to discuss investment analysis and execution for private infrastructure transactions in detail. There are however a few interesting aspects to point out as they relate to the specific characteristics of private infrastructure transactions discussed in this paper.

- The proper assessment of investment risk in infrastructure requires a careful analysis and assessment of downside cases. As discussed before, infrastructure investments are often dominated by credit exposure. This risk is not adequately captured by (small) variations in input variables common in equity analysis but requires a credit analysis where probability of default and loss given default are analyzed.
- The long-term nature of many infrastructure investments add to the difficulty to determine the adequate required return for a project as there is less market data to

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inform this decision.

- Access to a broad range of private infrastructure transactions across countries, sectors and market segments therefore provides very valuable information about the level of risk premia that can guide allocation decisions.

### 4. INFLATION PROTECTION CHARACTERISTICS OF INFRASTRUCTURE

Another aspect of infrastructure that is often highlighted as a main attraction for investors is its perceived inflation protection characteristics. While most investors accept the notion of infrastructure as a real asset class as a given, Partners Group thinks it is important to understand more fully how inflation affects the returns of different infrastructure assets. This understanding allows a better assessment over what time period and to what extent an infrastructure portfolio will deliver the desired inflation linkage. In this section we will therefore examine how Partners Group goes about assessing the inflation characteristics of infrastructure investments and how this assessment is used in the context of portfolio construction.

First of all it is helpful to define what inflation protection means. Partners Group would characterize an investment as inflation protected when its nominal return exhibits a close positive and immediate correlation with changes in inflation whereby the sensitivity may be greater or smaller than one. So, while most infrastructure investments offer positive inflation linkage (or correlation) of their returns over time, they may not be inflation protected in this relatively strict sense. It is therefore important to understand the impact of inflation on the business model of an infrastructure asset to determine how exactly inflation will affect the returns. There are a number of factors to consider:

- **Revenues:** The revenues generated by many infrastructure assets are contractually linked to a specific inflation measure. For instance, regulated monopolies like networks, toll road concessions or renewable feed in tariffs have explicit inflation linkage built into the remuneration formula in many countries (e.g. UK, France, Spain, Italy, Latin America). This offers the most direct and immediate inflation linkage as revenues will automatically rise in line with the specific indexation formula. On the other hand, there are infrastructure assets which are regulated on a nominal rate of return basis (e.g. US utilities). These assets still exhibit inflation linkage in the medium term as allowed rates of returns will be adjusted to reflect changes in inflation but the adjustment may take time so returns in the short term can be negatively affected by an unexpected rise in inflation. There are also assets that earn fixed tariffs or have contracts with a defined price and/or revenue escalation which exposes them negatively to an unanticipated rise in inflation. For less regulated assets, the analysis of the impact of inflation on their revenues requires a fundamental assessment of their ability to pass on price increases to their customers. Given the high entry barriers and the low price elasticity of demand typically associated with infrastructure assets, many in fact have considerable pricing power and hence the ability to protect their returns in periods of rising inflation. However, this requires a fundamental analysis and assessment of the specific asset and is subject to errors.
- **Operating costs:** Infrastructure companies tend to have high operating margins. This reduces the effect of rising costs on the cash flows generated by the business. In addition, contracts often allow passing on rising input cost to the off-takers which further substantially reduces their exposure to unanticipated cost inflation.
- **Replacement value:** Infrastructure businesses are typically asset heavy businesses. In



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addition these assets such as gas pipelines, electricity distribution networks or airport or port facilities serve essential needs and have long economic lives with little risk of technical obsolescence. In a period of unexpected inflation, the associated increase in replacement cost should consequently increase the value of existing facilities and protect investors from the impact of inflation experienced over the period. While this relationship should hold in the medium to long-term, values can significantly deviate from replacement cost for extended periods in the case of excess capacity and/or lack of pricing power (e.g. long-term contracts entered into before the rise in inflation). However, as long as existing assets trade substantially below replacement cost adjusted for depreciation, no new investment will take place which should eventually force asset prices up.

- **Capital structure:** Unexpected inflation will depreciate the real value of nominal debt. The sensitivity of infrastructure equity to changes in inflation rates will therefore be highly dependent on the financial structure of the asset. The magnitude of this effect depends on a) the degree of financial leverage, b) the duration of debt and c) whether the debt is fixed or floating rate.

### Implementation

One of Partners Group's stated objectives for private infrastructure portfolios is to provide strong inflation linkage of returns. In order to achieve this objective, Partners Group classifies infrastructure investments in three buckets based on its bottom-up assessment of the different ways inflation is impacting the returns of its infrastructure investments:

- **Contractual:** As mentioned above, revenues can be contractually linked directly to inflation i.e. frequent inflation adjustments are effectively guaranteed and enforced via a contractual obligation. For example, in Q3 2011, Partners Group signed an agreement to enter into a joint venture with the Italian power company Sorgenia SpA to develop and own a wind portfolio in France. The feed-in tariff for wind facilities in France has a contractual inflation linkage, which means the tariffs received by the wind assets will be adjusted annually by the specified inflation index, allowing Partners Group to maintain its real yield on the investment. In fact equity cash flows should grow disproportionately as debt payments are fixed.
- **Correlated:** Inflation correlated investments exhibit a strong but not direct linkage of their revenues to changes in inflation. For instance, in Q2 2010 and Q1 2011 Partners Group invested in floating rate subordinated debt issued by Newcastle Coal Infrastructure Group ("NCIG"), the operator and developer of a large coal export terminal based in Newcastle, Australia, backed by long-term ship-or-pay agreements<sup>1</sup> from a number of creditworthy coal mining companies. In this case, the floating rate based on three months BBSY (Bank Bill Swap Bid Rate) makes this investment inflation correlated, as changes in inflation should translate into changes in short-term interest rates.
- **Nominal:** Finally, there are also attractive investment opportunities available through assets with fixed payments and it would be overly limiting to avoid these assets entirely. For instance, Partners Group has exposure to Porterbrook Leasing ("Porterbrook"), a leading railway rolling stock operator lessor in the UK with about 32% market share of the UK passenger leasing market which currently owns about

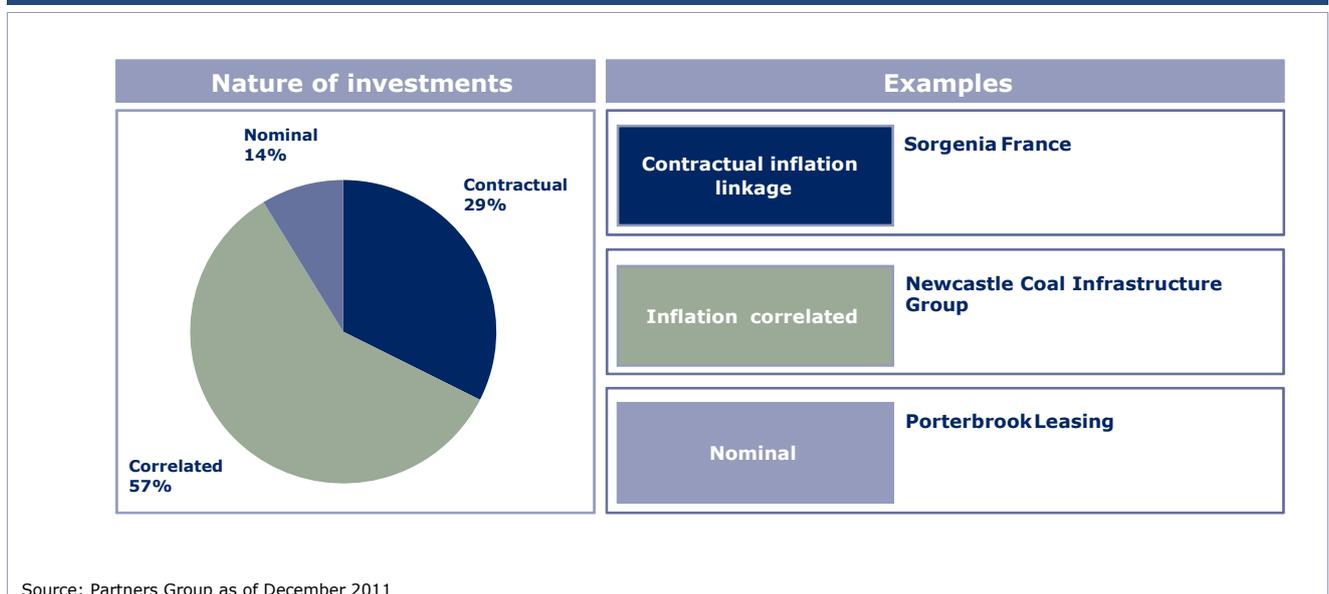
<sup>1</sup> A provision by which a buyer agrees to pay for contracted transportation capacity regardless of actually transported volumes.

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5700 vehicles with a book value of GBP 2bn. The contracts which Porterbrook has with the train operating companies are fixed on a nominal basis. However, the high level of security around the leases, the barriers to entry of the market and the attractive buy and hold lifetime IRR compensate the investor for the limited inflation linkage. Furthermore, in the case of a lease renewal, there is the potential to pass the inflation through to the company's customers.

Exhibit 6 shows the allocation to different categories for Partners Group's 2009 Global program. It shows that more than 85% of the portfolio is either contractually linked to inflation or correlated with inflation.

### Exhibit 6: Inflation linkage of assets in PG Global Infrastructure 2009 L.P.

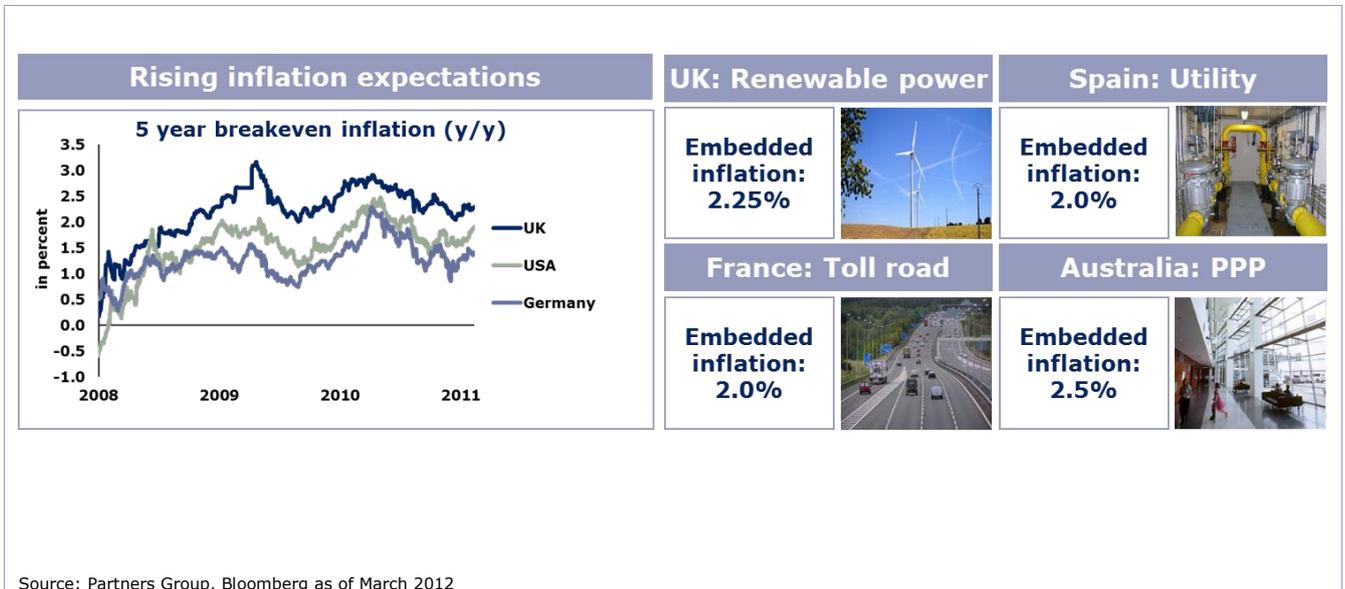


In addition to analyzing in detail how inflation is affecting the investments it makes, Partners Group also considers the inflation assumption embedded into the investment case the investor is expected to buy into. For instance, as the financial models which are constructed to measure the return on the investment are built using a cumulative inflation formula (i.e. inflation is assumed to annually increase the previous year's revenue), it is important to make sure that appropriate assumptions are used in this calculation otherwise the investor may overestimate the return on the investment he is underwriting.

Exhibit 7 below shows market implied inflation expectations for different countries over the next five year period based on breakeven inflation rates (the difference between yields on nominal and inflation linked government bonds). To base investment decisions on inflation rates greater than these market estimates would be ambitious. Partners Group has made conservative long-term inflation assumptions for some of its recent investments in the UK, Spain, France and Australia.

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### Exhibit 7: Embedded inflation assumptions in different infrastructure investments



## CONCLUSION

The purpose of this research flash is to discuss Partners Group's view of how investors should construct and implement an infrastructure portfolio in order to improve the risk/reward relationship and achieve inflation linkage.

The approach to portfolio construction is based on understanding drivers of infrastructure returns which are characterized by a non-standard return distribution with a fat left tail and a high proportion of non-systematic risk.

Having identified the unique risk factors of infrastructure investing, we suggest practical steps on how to build a portfolio along the main allocation parameters of stage, country, sector, asset weights and vintage years and also highlight the necessary abilities an investment manager should possess (such as a global origination platform and ability to conduct secondary transactions) in order to implement robust portfolio construction.

The degree of inflation linkage varies significantly across different infrastructure assets. Building an infrastructure portfolio with strong inflation protection characteristics therefore requires the careful analysis of how inflation affects the cash flows and asset value of an infrastructure investment and what inflation assumptions are embedded in the investment case.

In conclusion, Partners Group strongly believes that systematic diversification across a number of risk dimensions in infrastructure investing can significantly improve the risk/return profile of the resulting portfolio and help to achieve the investor's objectives of consistent performance with a significant inflation linked yield component.

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