

Climate change,
clean energy infrastructure and
strategic asset allocation

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Mercer, the global asset consultant to many of the world's pension funds and institutional investors, published a seminal report in 2011 on the implications of climate change that caused many investors to rethink their approach to strategic asset allocation.

The report also came at a time when asset allocation generally was, and continues to be, critically reviewed in the wake of the prolonged global financial crisis. Many investors and their advisors are deeply concerned about the increased correlation of global equities markets and the failure of some alternative assets, such as commercial property, to provide the expected diversification benefits to their portfolios. The use of excessive leverage within various 'real asset' strategies such as property and certain types of infrastructure assets, has been reassessed as the root cause of that failure. Debt created an unseen or underestimated correlation of certain alternative assets to the sub-prime failure that undermined the planned for risk diversification in many pension fund portfolios.

In that context, what might investors take away from some of the critical recommendations in the Mercer report regarding the implications of climate change for strategic asset allocation? To paraphrase some of Mercer's key findings:

- Climate policy is a significant source of portfolio risk for institutional investors to manage over the next 20 years and could contribute as much as 10% to overall portfolio risk;

- Mitigating climate change risks will require a new approach for investors with the short-term nature of traditional equity and bond investments making it difficult to price in long-term risks around climate change;
- Traditional methods of shifting asset allocation into increased holdings of more conservative, lower risk and lower return asset classes may do little to offset climate risks and may even reduce returns and adversely affecting long-term portfolio performance;
- Under some scenarios, the best way to manage the portfolio risk associated with climate change is to increase allocation to 'climate sensitive assets';
- Up to 40% portfolio allocation to 'climate sensitive assets' (including infrastructure, real estate, private equity, agricultural land, timberland and sustainable/listed and unlisted assets) could actually reduce portfolio risk in terms of climate change impact;
- There are steps that investors can take now to improve the resilience of their portfolios to climate related risks, including increasing their asset allocation to climate-sensitive assets as a 'climate hedge'.

Moreover, there is a growing awareness among institutional investors that climate change and in



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particular the policies of governments in response to it, will impose significant financial liabilities as well as create the opportunity for new asset creation. It will impact existing asset values yet create other long-term investment opportunities, especially in the mitigation of carbon emissions investment in clean energy and necessary adaptation for the physical consequences to our environment.

One of the more important messages for pension fund investors, in particular, was Mercer's observation that an increased allocation to 'climate sensitive assets' 'offers the prospect that institutional investors' interests can be aligned to both serve their beneficiaries financial interests as well as to help tackle the wider challenge of climate change by increasing investment in mitigation and adaptation efforts globally'.

Whilst there has been a reasonable degree of analysis in the financial literature regarding equities strategies around climate risk, we are focused here on options for investors within alternative assets generally and, more specifically, with an analysis of clean energy and infrastructure assets (CEI assets). In Capital Dynamics' view, CEI assets are climate-sensitive in that they stand to benefit in a positive financial way from both current and likely future climate policy. This is because our energy industries

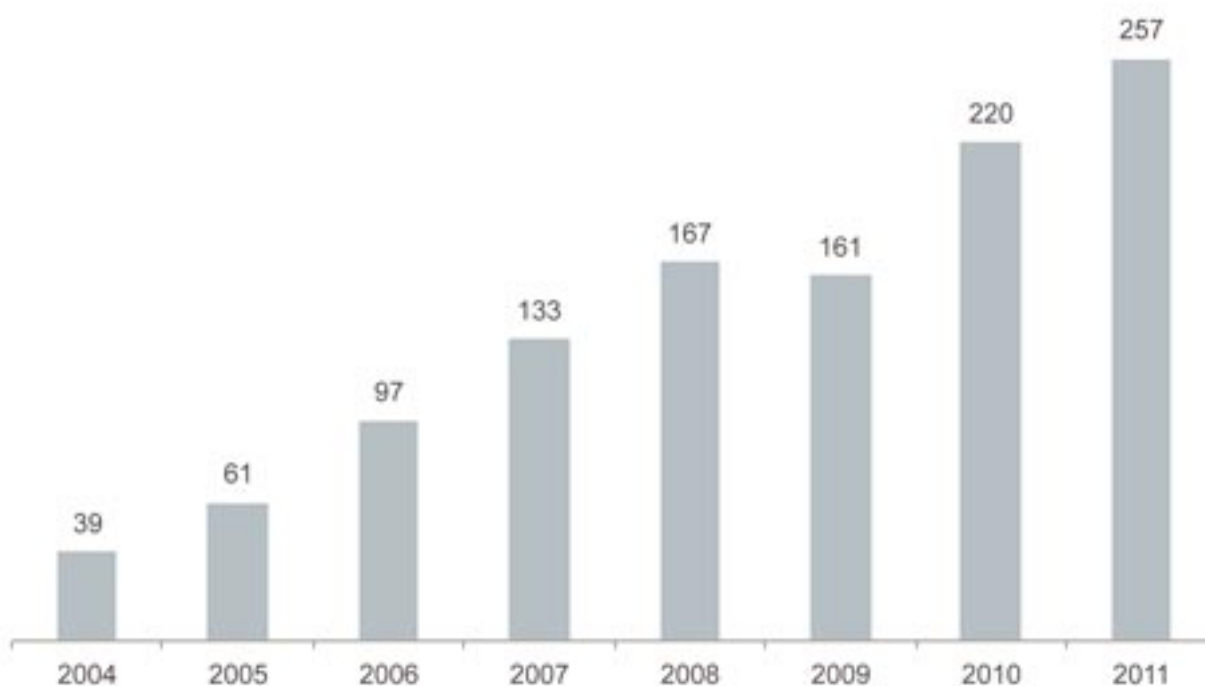
are likely to be fundamentally transformed in coming decades in response to climate policies, energy security and the need to replace ageing infrastructure. Clean energy supply projects stand to benefit directly from new costs imposed on carbon-intensive energy as well as various investment incentives to encourage massive new capacity build in renewable and low-carbon energy supply alternatives.

According to our analysis and client feedback, many pension fund and insurance industry investors, whilst not necessarily seeking 'climate sensitive' investments currently, are seeking returns from an allocation to 'real assets' within the alternative asset class that feature:

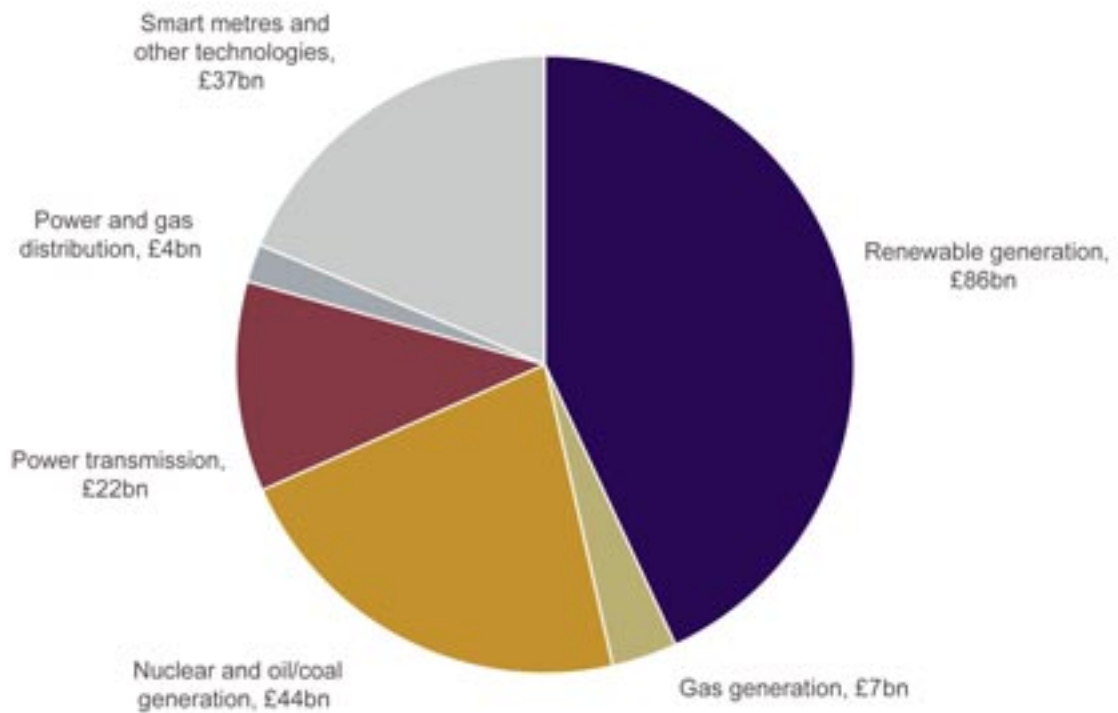
- Visible and recurring cash yields with 10 year plus horizons;
- Revenue quality in terms of both high credit backing and low volatility;
- Capital appreciation to help ensure that total returns still exceed those from traditional assets, especially diversified and liquid equities;
- Inflation hedge from revenue escalation to maintain cash returns in real terms given the typically long-term nature of these investment commitments.

Fig. 1: Global investment in renewable energy 2004-2011 (US\$ billion)
Source: REN21, 2012

Global investment in renewable energy 2004-2011 (US\$ billion)



UK energy investment requirements to 2020 (£199bn)



Arguably these features can be found to a greater or lesser extent in several alternate assets, such as property and infrastructure. This partially explains why we are seeing more investors making increased allocations to alternatives generally with a primary emphasis on new infrastructure. However, the 'climate sensitivity' of assets within these two broad categories of alternate assets does vary considerably.

Therefore, with investors seeking more exposure to higher yielding 'real assets', are there strategies that can deliver these return features and also act as a climate 'hedge' in the sense contemplated by Mercer? In our view, clean energy infrastructure assets can fit that bill because of their long-term cash yield profiles and the direct environmental benefits that they deliver, especially in the offsetting of carbon emissions from the power generation sector. Emissions from electricity generation are the single largest stationary source in the world today.

Global investment in clean energy infrastructure

Investment in clean energy globally has increased six-fold since 2004. Last year was a record year for global investment in clean energy, reaching US\$257bn, up 17% on 2010 and contrasting the

wider global slow-down. Moreover, in 2008, more investment was committed to clean energy assets in Europe and the US than new conventional power capacity (coal, gas, nuclear) for the first time ever. The carbon cost implications of coal, the geopolitical issues surrounding gas supply (in Europe at least) and the recent rekindling of nuclear safety concerns, may ensure that this trend continues well into the future. These drivers and others may do more to attract the interest of institutional investors than ever contemplated.

Growth in investment demand in coming years is also expected to more than double from the 2011 record level just set, reflecting the capital required to develop and construct the new clean energy capacity mandated by the various targets set by governments in both developed and emerging economies in recent years.

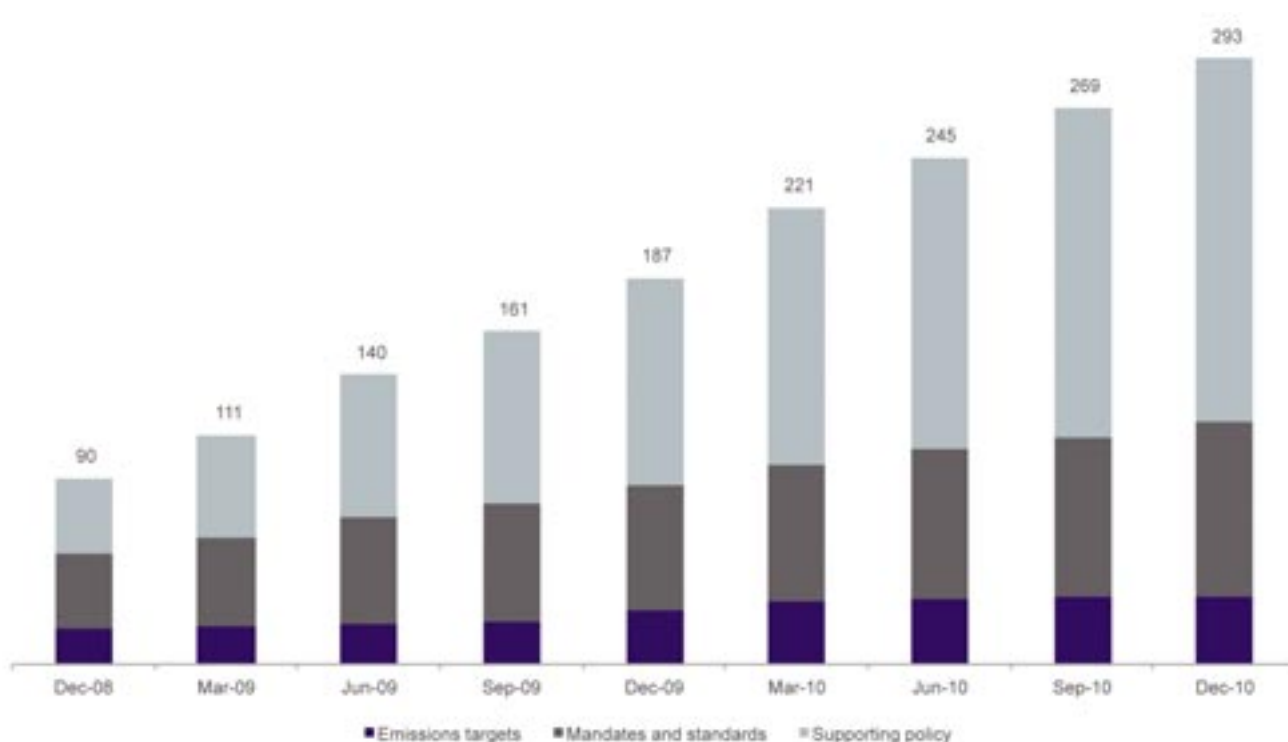
The UK is considered one of the more attractive renewable markets in the developed world and is expected to require approximately £200bn in new energy infrastructure investment by 2020. However, the UK lags significantly behind its renewable energy targets, some of which are the highest in the world (Scotland is targeting 100% of renewable electricity by 2020) and ageing

Fig. 2: UK energy investment requirements to 2020 (£199bn)
Source: E&Y 2012



Investment in clean energy globally has increased six-fold since 2004

Global cumulative binding and accountable climate policies 2008-2010



infrastructure is leading to a critical demand/supply gap. The UK government continues to support clean energy investment to address this gap, aiming to provide up to 400,000 new jobs and save the UK an expected £60bn in fossil fuel imports.

Significant new equity capital will be required, as traditional debt finance will fall way short of these capital needs. This provides an attractive opportunity for institutional investors. Fig. 2 shows an extracted from a recent Ernst & Young report that breaks down this capital need across various energy infrastructure segments.

Fig. 3 extracted from a Deutsche Bank Climate Change Advisors (DBCCA) report of the cumulative regulatory impetus behind clean energy and climate policy in recent years. Whilst this has slowed in recent times due to increasing economic woes in Europe predominantly, the trend is positive.

However, despite this rapid growth, institutional investors have been only modest providers of capital to invest in new clean energy infrastructure. The bulk of capital for new asset finance has been committed by banks, industrial corporations, project developers and energy utilities. With the growing scale of investment demand, as shown in Fig. 3, the increasing awareness of the attractive investment

features of clean energy infrastructure and new thinking in response to climate change, such as that by Mercer, allocations from institutional investors to CEI assets are set to grow.

Investment features of CEI assets

The investment universe of CEI assets is broad, but has at its core the production and supply of clean, renewable and low-carbon energy. Examples include electricity, steam and heat supplied from any one or more of solar and wind energy, combined heat and power using natural gas, power from biomass and organic waste, geothermal energy and even projects using 'hard assets' to increase energy efficiency.

In terms of more conventional alternative asset categories, CEI assets can be fairly viewed as exhibiting hybrid characteristics of both private equity and infrastructure, subject to the particular investment strategy being employed. Already built and operating assets look more like infrastructure assets, especially if they have long-term sales contracts, use well-proven generating technologies and operate in stable markets. Most investment required in the future, however, will be in new asset creation, requiring the mass-scale development and construction of new capacity to meet ongoing

Fig. 3: Global cumulative binding and accountable climate policies 2008-2010 (includes policies from MEF countries, EU government and major US states (CA, NJ, TX))
Source: Deutsche Bank, 2011



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demand growth and the need to reduce carbon emissions. Those assets may look more like 'growth infrastructure' assets to some investors.

For this reason, CEI assets offer attractive flexibility in asset allocation terms depending upon where investors are seeking to bolster their portfolios. This can be seen in Fig. 5 (opposite).

What are the features of typical CEI assets that may interest investors, especially in terms of portfolio diversification? Most CEI assets are capital intensive, have long economic lives of 20 years or more, generate operational income from selling energy on a continuous basis and/or earn additional revenue from investment incentives offered by clean energy regulation and/or climate policies in various countries. Therefore, revenue can be either regulated over the longer term (with fixed prices, linked to inflation in many cases) or contracted bilaterally to buyers such as energy utilities or energy consumers.

With proven generating technologies, revenue volatility stemming from annual production volumes can be predicted with reasonable certainty by the experienced investor over the long term. Also, asset maintenance costs can be ascertained and factored into the investment evaluation at the outset. With the credit of the revenue being either regulated (with

sovereign support in some cases) or contracted to investment grade utilities, the implicit 'quality' of future revenue streams can be high.

Fig. 6 (opposite) is a representative example of an investment in a UK wind farm that was recently constructed with a 15 year sales contract to an A-rated energy utility.

The area shaded in red represents the revenues to be derived from the sale of Renewable Obligation Certificates and Renewables Levy Exemption Certificates under the UK Renewables Obligation for the life of the project. The blue shaded area represents the revenue to be derived from the sale of electricity. Both revenues are underpinned by the energy utility that is the long-term customer of the project's energy supply.

This return profile ought to attract the attention of pension funds in particular given the long-term cash generation offered by CEI assets. Solid annual cash yields plus an attractive absolute return potential gives this investment strategy its 'hybrid' character, straddling both private equity and infrastructure.

In Mercer's analysis, infrastructure assets will be a 'core part' of the adaptation and mitigation efforts of all governments in responding to climate change.



Clean energy infrastructure is growing just as much in importance for strategic asset allocation as it is in sheer investment scale each year

Fig. 4: CEI asset universe
Notes: 1) 2011 new asset investment, source: Bloomberg New Energy Finance, 2012; 2) includes marine and small hydro; and 3) includes energy-smart technologies such as smart grid, energy management, electric vehicles and power storage, some of which do not fall within the target sectors of the fund

CEI asset universe



CEI assets – flexible asset allocation

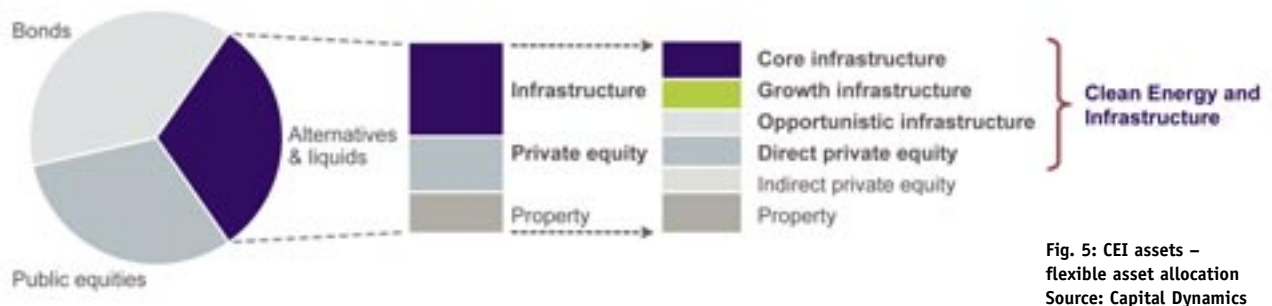


Fig. 5: CEI assets – flexible asset allocation
Source: Capital Dynamics

UK wind farm revenue contribution and cumulative IRR (2009-2028F)

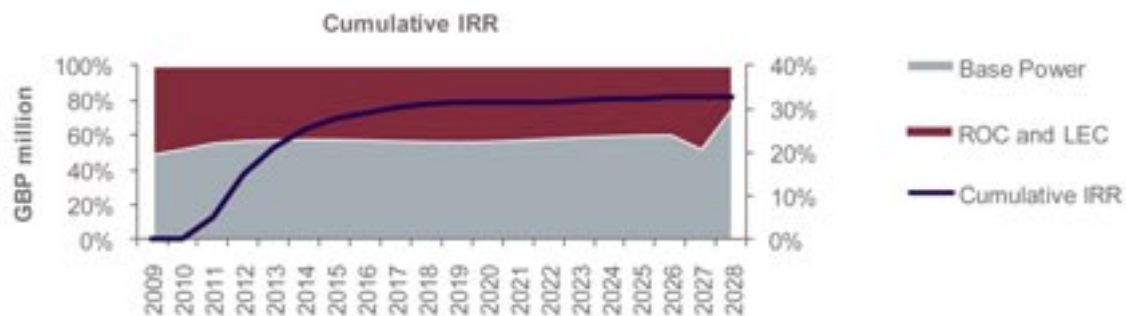


Fig. 6: UK wind farm revenue contribution and cumulative IRR (2009-2028F)
Source: Capital Dynamics, company reports

Existing assets that are carbon-intensive will need to re-tool and the creation of new assets that assist directly in adaptation and mitigation, each have a dominant infrastructure theme. Interestingly, Mercer observed that traditional infrastructure portfolios may transition and move towards these new opportunities by allocating more to ‘non-core assets such as development projects...’.

The greatest opportunities for institutional investors were seen by Mercer to be in energy, transport and water/waste. In energy specifically, there was a strong emphasis on renewable and decentralised energy, as well as related infrastructure such as transmission and distribution networks. Importantly, unlisted renewable energy infrastructure (encompassed within the definition of CEI assets) was considered to have a very high climate sensitivity, exceeding that of ‘core’ infrastructure in all scenarios.

Despite the enthusiasm exhibited by Mercer, what about the risks of investing in CEI assets? Like all ‘real assets’, appropriate risk management requires

a thorough understanding of the asset class and a clear differentiation between controllable and uncontrollable risks. The key uncontrollable risk is that of regulatory change. Investing in energy markets requires a familiarity and comfort with changing law and regulations given that energy is a heavily regulated sector and not just clean energy. However, the current regulatory momentum is clearly in favour of clean energy, and a quick comparison between the landscape of regulatory risk now faced by a fossil fuel supplier relative to that of a clean energy supplier only serves to highlight that fact.

The key points to take away for institutional investors is that clean energy infrastructure is growing just as much in importance for strategic asset allocation as it is in sheer investment scale each year. It may be worth becoming more familiar with the risk and return characteristics of well-structured investments in CEI assets since it seems that these assets address many of the imperatives driving key decisions for pension funds as climate risk comes to play a more central role in their future investment strategies.

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Putting strength into structure

With large-scale investment in infrastructure increasingly required to enable growth, and traditional private finance out of favour, a new 'PFI 2.0' will require expedient political backing, writes Public Service Review

On the subject of the UK economy there are seldom areas of universal agreement amongst the politicians of different parties, academics and interest groups, or even civil servants from the multiple strata of the state. Nevertheless, a rare and almost unanimous consensus of opinion exists in the UK on our infrastructure: it is under strain, and something needs to be done about it. Despite having the world's seventh largest economy, the World Economic Forum ranks the UK as only 28th in the world on the quality of its infrastructure. Perhaps even more alarmingly, only 26% of businesses that took part in a recent survey saw the UK as a favourable destination for infrastructure investment.¹ Clearly the conservative level of development and renewal of infrastructure is a potential Achilles' heel in the pursuit of economic growth, and while that growth is clearly coveted by the current government, for the first half of its tenure that has proved elusive.

There are two main obstacles in the way of large-scale investment in infrastructure. The first is political. At least one part of the Coalition has ideological problems with a Keynesian-style public investment in infrastructure schemes – the mere suggestion flies in the face of the Friedman-inspired liberalisation mantra espoused so effectively by the Conservatives' celebrated matriarch. Moreover, both partners signed up to a frugal financial policy based on eliminating the structural deficit within a term. Combined, these standpoints make public investment via traditional forms of debt politically dicey for ministers. Instead they would prefer the private financing of projects, albeit funded from pension pots and sovereign wealth funds, rather than investment banks. Therein lies the second major obstacle; the main vehicle for delivering private investment within infrastructure schemes over the

past two decades, the Private Finance Initiative (PFI) has been roundly lambasted by parliamentarians from all sides. So intense was the barrage of criticism of the model that George Osborne announced that PFI would be subject to a 'review', which would scrap it in its current format. How then can pension holders' and foreign governments' money be ploughed into infrastructure while delivering value for taxpayers and remaining a worthwhile investment?

The man charged with finding a solution to this conundrum is Infrastructure UK (IUK) Chief Executive Geoffrey Spence. After a career working mainly in the world of private finance with Deutsche Bank and HSBC, Spence should be well placed to understand the needs of the organisations that government is wooing to invest in infrastructure projects. He should also be sensitive to the requirements of the Treasury, with a decade of corporate memory accumulated heading up the PFI unit at 1 Horse Guards Road and later as an advisor to Alistair Darling in his tenure as Chancellor. Now leading the 60 strong IUK team, Spence has been fairly coy to date about his organisation's work to lever the private investment needed to deliver two-thirds of the National Infrastructure Plan.

In an interview earlier this year, Spence was guarded about the dialogue going on between IUK and pensions investors, which was, in his words, a conversation about "opening up a long-term source of capital for everyone; not just the public sector – not even mainly the public sector".² Two of those discussions, with the National Association of Pension Funds and Pension Protection Fund, received some negative press in a national newspaper – coverage Spence was quick to rebuff.



Despite having the world's seventh largest economy, the World Economic Forum ranks the UK as only 28th in the world on the quality of its infrastructure



UK infrastructure is under strain, and faces both political and financial obstacles

“We’re not going to them and saying: ‘We’re gonna raid your piggy banks to spend all this money’. For very good reasons, they all want to spend more money in terms of investing in infrastructure, and they want us to help them overcome some of the obstacles they face.”

An example given by Spence is the need for the public sector to change its attitude to risk on unusually difficult construction projects; however, Spence added the cautious rider that it’s not “a blank cheque for people to get a guarantee from government at any point in time; it is for government to be more realistic about what risks it can take and what still is the private sector’s role”. If Spence’s comments on risk were vague, his remarks on reforming the PFI model were opaque. He preferred to defer any indications of what a post-review financing model might look like until the close of the consultation now being analysed by officials. He did, however, mount a retrospective defence of PFI, and argued that a phased change of approach should have been adopted. “A better way of taking a policy forward is always to look at where it could be improved and to try and achieve a process of incremental change,” he said, going on to put the model into context with other procurements: “We’re far more transparent about PFI than we are about anything else in the procurement space.”

So perhaps PFI is not completely dead? Regardless, solid details of a functional finance mechanism are a prerequisite if the Chancellor is to achieve his aspiration of harnessing pensions to invest in infrastructure. Spence’s refusal to give any hints to industry on the likely outcome of the PFI review came after what many view as procrastination by the government on project finance. IUK was without permanent leadership for over six months after the departure of former CEO James Stewart because of perpetual delays in recruiting Spence to the position.

Since then, the Treasury agency has repeatedly postponed its review findings – the call for evidence closing over five months ago. A June article in *The Independent* has, however, indicated that there is light at the end of the tunnel, reporting that Spence is set to unveil ‘PFI 2.0’ at a summit in September.³



The conservative level of development and renewal of infrastructure is a potential Achilles' heel in the pursuit of economic growth



The new model is likely to allow pension funds to inject debt as well as equity into projects, reducing the investment risk. Shortly following that press report, Spence delivered the keynote address at Public Service Event's 'Pensions: Infrastructure Investment' conference. He told delegates how government is approaching the agenda. "We recognise for all classes of investor we need to improve the attractiveness of the UK and its infrastructure," said Spence. "The way we look at pension funds is as new investors. For the majority of pension funds, and even those that have participated recently in this market, infrastructure is a new asset class. From that point of view, the government wants to remove the barriers to investment for pension funds."

Spence specified these obstructions: "One of the barriers that we have seen is a problem of collective action. For some there is an issue about construction and there are also some problems around access. Even if you want to invest during the construction period, actually you can't do that by investing at financial close – you have to go to a fund in the city and hope they win a number of different projects. You take bid risk, development risk for the early stages and then at financial close the money is invested. There is no way at the moment for pensions to invest directly."

He went on to explain how IUK proposed to break down the obstacles. "The first key development is to have the right interlocutor for the pension fund industry. As a first development, it's right that we should put in place that skill base, industry-led and capable of making safe and good investments. We are putting in place risk mitigation options, and addressing access issues such as the model. Let's move away from the 90/10 model to an un-gearred or partially geared model. That changes the way we procure things and financially structure projects."

In summary, the consensus remains that there needs to be large-scale investment in infrastructure to enable growth. It's reasonable to assume that the environment in Westminster does not allow for investment funded by an increase in the national debt, and that private finance through pension funds and other sources is preferred. With traditional PFI out of favour, a new or adapted model 'PFI 2.0' requires expedient political backing. If ministers want to make their rhetoric about utilising pension and sovereign wealth funds a reality, then the time to stop navel-gazing in Whitehall is now. Geoffrey Spence's most recent comments give some cause for optimism.




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¹ www.kpmg.com/uk/en/issuesandinsights/articlespublications/newsreleases/pages/investment-in-infrastructure-would-kick-start-uk-growth-new-cbi-kpmg-survey.aspx

² <http://network.civilservicelive.com/interviews/csw/read/633819/interview-geoffrey-spence>

³ www.independent.co.uk/news/business/news/billions-to-flow-from-pfi-reform-7856339.html



Performance: the result of long-term dedication

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Our CEI team holds over 100 years of experience in investing, financing, owning and operating conventional and clean energy businesses globally. Capital Dynamics' CEI business was established to address the attractive investment opportunities in this new class of real assets. Please contact us at info@capdyn.com.

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