

ASSET MANAGEMENT & MAINTENANCE

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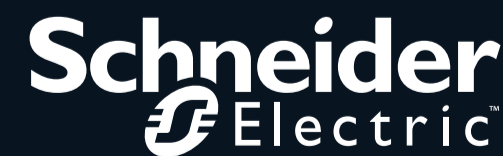
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INCREASE THE VALUE OF YOUR BUSINESS



Effective asset management can add value to a company at a time when resources are under growing pressure, writes **James Dean**

OVERVIEW

Looking after power stations, water treatment works, railway lines and other major physical assets is fast becoming a job for employees across entire companies. Sharing information or using technology to better analyse the risks and requirements of every asset are increasingly the concern of those sitting at the very top of the company – not just the expert asset managers.

With better use of data on physical assets, for example, companies could cut the lifetime cost of assets by as much as a fifth, according to professional services firm PwC. These are the sorts of savings that catch the eye. Good asset management means assets perform better, risks are managed more effectively and regulators are happier, says PwC.

The growing importance of quality asset management was highlighted in January when the International Standards Organization launched ISO 55000.

The new standard replaces the British Standards Institution's PAS 55, which was adopted internationally by manufacturing, utility, mining and transport companies.

ISO 55000 also has international force, but has wider horizons, to include financial as well as physical assets, and is becoming a hot topic of debate among asset managers around the world.

In the words of the Institute of Asset Management, which spearheaded development of ISO 55000 in the UK, the new standard creates "a global consensus on what asset management is and what it can do to increase value generated by all organisations, at a time when everyone needs to make the most of any resources they have".

Effective asset management is simply the best way to optimise the value of your assets, according to Daniël Pairon, global head of asset management at KPMG, the professional services firm.

"If you implement an effective asset management system, you will generate value for the bottom line, not to mention lots of non-financial benefits," he says.

"Bottom line" and "value" are the sorts of words that company bosses want to hear. Equally, they want to hear about the tangible non-financial benefits of having effective asset management prac-

tics, such as strengthening their brand and improving their company's reputation among customers and regulators.

Listed companies with effective asset management practices can tell shareholders about the value they are adding to their business and, ultimately, how these practices are making good their investment.

Mr Pairon, who was a member of the committee which developed the ISO 55000 standard, says it should help expand good asset management practice well beyond

Geoff Aitkenhead, Scottish Water's director of asset management, says certification brings a "clear alignment" between the strategic direction of the company and the management of its assets.

The IAME survey also shows that the number-one concern of asset managers is investment planning, with just over half of those surveyed citing it as a priority for the next 12 months. Half say they intend to invest in life-cycle modelling and tools for assessing the integrity and condition of their assets.

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the remit of engineers and technicians to all corners of a company.

A survey by the Infrastructure Asset Management Exchange (IAME) suggests that half of asset managers intend to invest in an ISO 55000 or other certification in the next 12 months. Some companies have already done so, including one of the UK's biggest utilities.

Scottish Water was the first company in its sector to receive a rubber-stamping for its adherence to ISO 55000. Robert Doughty, quality manager at the utility, says certification allows the company to demonstrate to customers and regulators that it has achieved a high level of professionalism in the way it manages its assets.

This ultimately helps it to produce clean drinking water and treat waste water in a safe and efficient manner.

Increasingly, asset managers want greater integration with finance departments. "More and more chief financial officers are becoming interested in asset management," says Mr Pairon. "They want to have an in-depth understanding about maintenance and other costs."

Improved management of the life cycles of assets and benchmarking their performance against other companies are also high on asset managers' agendas, along with assurance or ensuring compliance with local and national regulators.

However, balancing budgets for the day-to-day maintenance of assets and their longer-term strategic requirements will be a key priority for asset managers when budgets are limited. Asset managers may end up asking themselves: "If I have to make a choice, where am I going to spend my last pound?"



Good asset management means assets perform better, risks are managed more effectively and regulators are happier



The recession has placed a new and different emphasis on managing ageing assets, as Marcus Leroux reports

AGEING ASSETS

■ The adage that cash is king has never been far from the front of executives' minds since the onset of the financial crisis nearly seven years ago. Investors were understandably jittery about debt, while liquidity was crucial to help businesses steer clear of the tempest.

That was paralleled in the public sector by austerity measures and a heightened awareness of value-for-money considerations.

This pressure on capital expenditure, according to John Woodhouse of The Woodhouse Partnership, means there is a log jam of overdue renewal projects. Some £338 billion needs to be spent on economic infrastructure up to 2015, according to the Treasury.

Against a backdrop of constrained resources and tight budgets, dealing with ageing assets demands a more rigorous approach, says Mr Woodhouse.

In the past, both private and public sector organisations have tended to take decisions on the basis of "he who shouts loudest". "We're at a stage where there is an awareness of the deficiencies of this approach. There's a great deal of short-term, silo-based behaviour, with conflicting agendas that need to be resolved. But there's an increasing awareness that that is no longer satisfactory," he says.

The bottleneck of assets in need of replacement or renewal

means that some tough choices must be made. Organisations typically have a simplistic ranking of importance for prioritising investment – an approach that Mr Woodhouse says misses a key nuance.

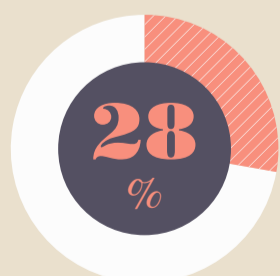
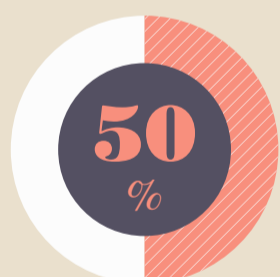
"The rate of change in the risks or costs is important. It's the slope that matters, not just the height. In other words, it isn't just about the size of the headache – it's a question of how fast it's going to get worse," he says.

An added complication is that ageing is a relative concept. "Ageing doesn't necessarily mean old – it can be with respect to changing demands," says Mr Woodhouse. This could be as a result of a change changing supply chain or volatility in the ultimate market place for a facility's goods.

Executives do not respond consistently or rationally to such shifts, research by The Woodhouse Partnership suggests.

"The attitude at main board level to capital investment was notably different between infrastructure investments to meet new demand or new technology, which is given plenty of air time, versus replacement of existing infrastructure, which is given significantly less attention, partly because it's not sexy," he says.

The decision to upgrade or replace existing assets tends to



Source: Health and Safety Executive



A sea change is taking place in the understanding of how maintenance adds value to an asset by protecting or increasing its lifespan

David Cameron's Government is replacing the RAF's ageing Tornado GR4 jets with the Eurofighter

be deferred for too long, which can lead to hurried and often sub-optimal choices. The opportunity to extend an asset's life can be overlooked or a botched upgrade can lead to companies being forced to pay twice for the work.

The recession was not the only force exacerbating the challenge posed by generations of ageing assets. The North Sea oil industry has been relatively immune from the slowdown, because of high prices in recent years. The price of oil has consistently been above \$100 a barrel for the last three years, compared with less than \$20 for much of the late-1990s.

Conversely, this has put pressure on ageing assets because it is viable to extend the lives of oilrigs or onshore facilities that would have been due to be decommissioned. As technical improvements and the higher price of oil have allowed smaller resources to be exploited, more pressure is put on existing main pipelines.

it turned out to be. An owner may only have a two-year time horizon, therefore it wouldn't be profitable for them to invest."

The stakes are high in the upstream oil industry, but the difficulties it faces are widely shared. High-profile examples of ageing assets being replaced include the Eurofighter and F-35 fighter jets replacing the RAF's Tornado and Harrier respectively, and the life extension of Britain and France's nuclear power stations.

"Most of our industrial footprint was built after the Second World War in the 1950s or 60s," says Mark Haarman, a co-founder of the Dutch consultancy Mainnovation. "On average technical assets have a lifetime of about 40 years, which means many assets have reached the end of their lives."

Data and condition-monitoring take on increasing importance in the management of ageing assets, which itself is a problematic because they will not have the sen-

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The Health and Safety Executive estimates that half of fixed platforms in the British North Sea had exceeded their original design life and that 28 per cent of accidental spills are because of ageing infrastructure.

Tim Walsh, senior vice president of asset integrity services for Lloyd's Register, says dealing with ageing assets is the "dominant issue" that he sees in his work around upstream oil and gas production.

"The quid pro quo [of increased oil recovery] is that infrastructure goes way beyond its intended life and needs to be maintained in such a way that it can support ongoing development," says Mr Walsh. "If the UK is to continue to be productive we have to manage the infrastructure that supports that productivity."

The Wood Review into North Sea oil earlier this year called for greater co-operation between operators to share infrastructure, such as pipelines, and co-ordinate development of remaining fields.

Mr Walsh says there is a growing awareness in the industry about the role of maintenance in protecting asset value. "The challenge is connecting integrity maintenance with the life of an asset," he says. "Where we have had issues because the assumed production life of an asset is much less than

sors that more recent models will have built in.

Perhaps surprisingly, Mr Haarman believes the recession has actually provided a spur for asset managers. A sea change is taking place in the understanding of how maintenance adds value to an asset by protecting or increasing its lifespan.

"A lot of maintenance and asset management departments have been asked to extend the life of assets," he says. "As a matter of fact, when we really analysed it, from an economic point of view it's often more valuable to do this than to replace them. What we found was there is no 'life of asset' anymore – you can continuously extend life by replacing critical components, but using the same infrastructure or framework."

The introduction of ISO 55000, an international standard for asset management, has also served to elevate the status of asset management in the boardroom, he argues.

"It's said a lot that maintenance managers aren't able to communicate the real value of maintenance to top management. The maintenance community speaks another language – they talk about technical stuff and top management talk about value-added," says Mr Haarman.

"Financial language has become more and more dominant in organisations from the shop-floor to the top floor, so maintenance managers are forced to speak the language of finance. Things are changing. More and more companies are looking not just at the bottom line, but at creating value." ■

CASE STUDY

BREATHING NEW LIFE INTO GAS PLANT



Sasol, South Africa's former state petrochemicals company, opened its Sasol Two plant at the new town of Secunda in 1980. Secunda is now the world's largest coal liquefaction plant, transforming coal into gas.

As the plant approached its 30-year anniversary, it faced the obsolescence of some of its most important components – the distributed control systems that behave as the facility's brain.

The control systems used at the plant – Honeywell's TDC2000 – had been taken off the market in the mid-1980s and concerns over the manufacturer withdrawing technical support had encouraged a growing belief in Sasol that it should invest in new control systems as soon as possible.

The problem was addressed using a process adapted by the Salvo Project for the optimisation of ageing assets. Salvo is a partnership of asset managers and owners, including The Wood Partnership, National Grid, London Underground, Sasol and Scottish Water.

However, the Salvo approach revealed that immediately moving away from the existing control systems would involve unnecessary investment. A risk analysis showed that at least eight years' additional life was achievable – a revelation that enabled Sasol to secure a new service and spares agreement

with Honeywell. "We gained support by showing vendors what the impact would be if we changed out immediately rather than doing a staged approach over a period of time," says Christine Pretorius, Sasol's industrial engineering leader.

By securing a longer life from assets, by an average of ten years, Sasol saved £18 million, by avoiding capital investment, and lowering costs and risks over the whole life cycle of the equipment. That represents 60 per cent of the original capital cost.

However, life extension is not always possible or desirable. The National Audit Office found in 2011 that the NHS needed to spend about £450 million on high-value capital equipment, such as MRI and CT scanners, over three years because of obsolescence and a rising clinical need.

According to the Association of Healthcare Technology Providers for Imaging, Radiotherapy and Care, the number of CT scanners dropped by a third between 2010 and 2012, with the number of digital X-ray rooms falling by half. The association argues this will store up future problems and have knock-on consequences elsewhere in the system, as ageing and increasingly unreliable equipment is relied on for more work.

COMMERCIAL FEATURE

A gold standard in asset management

A holistic approach to managing physical assets will create sustainable value, both financial and non-financial, over an asset's life cycle, says **KPMG**

The new ISO standard for asset management, published in January, provides an international framework which was inspired by best practices worldwide. Specialists, including KPMG, from more than 35 countries, in varied areas ranging from technical engineering to operations and finance, participated in developing the standard.

As a subject expert, the KPMG Global Asset Management Competence Centre was formally involved in the drawing up of the ISO 5500x series of standards from the very beginning. Based on its expertise in the field, KPMG was the only one of the big-four accounting companies to be invited to be an International Organization for Standardization Technical Committee 251 member, the group responsible for drafting the standards.

One of the reasons why we played such a key role in the development of the new standard is that the KPMG network has extensive experience advising or auditing asset-intensive organisations on asset management and is considered to be a pioneer in this area.

We've been working with our partners to achieve better valuation for those implementing the new standard. ISO 55001 now gives asset-intensive organisations worldwide a comparable and internationally recognised framework for asset management, offering a holistic approach to financial, operational and technical functions, while contributing to the strategic objectives of the organisation.

The new standard also allows organisations to establish a structured, consistent and transparent life cycle for their assets. By implementing ISO 55001 as an asset man-



agement framework, the cycle of assets within an organisation will be structured, consistent and transparent for all stakeholders, generating more value and ultimately benefit the organisation's bottom line.

Thanks to this new standard, organisations will be able to integrate operations with finance and accounting activities resulting in more transparent and efficient financial-technical reporting on assets, including reports on the performance of assets and asset risks. In addition, organisations will be able to establish a lean principle that enhances the entire life cycle asset management, including costs, investments, asset performance and asset risks. This way of working will provide managers and leaders with a clear and undisputed audit trail.

ISO 5500x clearly establishes the importance of asset management in the overall strategy for asset-intensive organisations. This will help create more awareness of the importance of the function at

board level. The board will realise the full potential of asset management, and will support asset management-related decisions and projects.

As organisations implement ISO 5500x standards, a growing number of companies around the world will be looking for a strong team of advisers – operational, technical, IT and tax – and auditors who can assist them with the analysis and creation of their asset management system, from strategy over asset operations to all required enablers.

They will find those trusted advisers at the KPMG Global Asset Management Competence Centre. KPMG experts are ready to provide their global expertise towards contributing to organisations' sustainable future.

For an initial conversation, contact our expert Daniël Pairon at dpairon1@kpmg.com



ISO 5500x clearly establishes the importance of asset management in the overall strategy for asset-intensive organisations

Whole-life management from design to long-term maintenance

Amey champions whole-life asset management around the world



Eight years ago Amey, a leading infrastructure asset management company, spotted a gap in the market and bolstered their business with the acquisition of engineering consultancy Owen Williams.

Amey has since become one of the fastest growing consultancies in the UK bringing together professional services capability with the company's contracting and maintenance services to provide a fully integrated offering that's overlaid at every stage with asset management expertise. The company now employs more than 3,000 consultants who work closely with the rest of the business.

The company, which turns over £2.3 billion annually and employs 21,000 people, was one of the first to pioneer this new concept of "whole-life" or "end-to-end" asset management, and is now championing and operating it globally.

Traditionally, asset management involved one company scoping out the infrastructure requirement, another one designing it – be it a bridge, road, school or power station – and yet another managing and maintaining it over the rest of its lifetime. This fragmented approach significantly increased costs and the potential for errors.

Today Amey offers whole-life or end-to-end asset management to service its clients in a seamless, cost-effective way.

"We realised that we could not only help our customers to manage their assets in line with their constrained budgets, but help clients make more informed decisions about future investment into assets, ensuring they are designed with long-term maintenance in mind," says Amey chief executive Mel Ewell.

This approach means that consideration of investment into the asset life cycle forms an integral part of the process, rather than something which is only addressed as assets begin to deteriorate.

Andy Milner, who heads up the drive for Amey's whole-life asset management capability, explains: "We help our clients to understand their infrastructure in even greater depth so that they can make really smart long-term decisions. We support them

at every stage from strategy and risk, through to decision-making, design, delivery and then maintenance. Our unique approach is one thing that stands us apart from others, by understanding the whole process of managing an asset."

Last year, Amey continued to expand the scope of its services through the acquisition of Enterprise, a leading provider of waste, utilities, infrastructure and social housing services in the UK. The acquisition was pivotal for the marketplace, creating a business with the breadth and depth of service to respond to today's market dynamics, more comprehensively and cost effectively.

"Enterprise was a strategic fit with Amey as we offered services across complementary markets such as transport, waste and facilities management," says Mr Ewell. "We brought our knowledge and experience in whole-life asset management to new sectors like utilities, offering clients cost-savings and a seamless end-to-end service, through a single provider."

"There's also a huge geographical advantage as we now have a presence in almost every area of the UK."

Amey's end-to-end asset management process is, therefore, not only being applied in new markets in the UK, such as utilities, but is being expanded internationally in the Middle East, the United States and Australia.

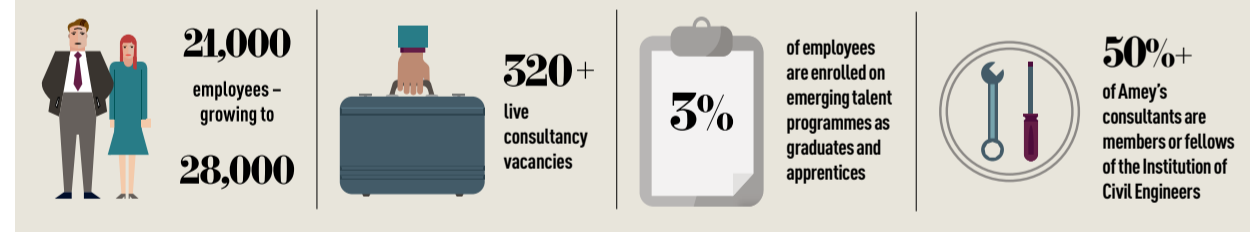
The Amey team in the UK is now championing asset management around the world through establishing Ferrovial's Asset Management Centre of Excellence. Amey's parent company Ferrovial is one of the world's



Amey offers whole-life or end-to-end asset management to service its clients in a seamless, cost-effective way



AMEY IS THE UK'S FASTEST GROWING CONSULTANCY



leading infrastructure management and investment companies.

"As a growing business the immediate challenge we face is finding talented people who can look after every aspect of an asset's life from design through to maintenance," says Mr Ewell. "We're looking to create another 6,000 to 7,000 roles over the next few years across the UK and internationally. It's an ambitious target, but I believe that the talent is out there, and we're ready to recruit and develop it for the benefit of our clients around the world."

Amey is the only company in its sector to hold Investors in People Champion status, and is currently recruiting for roles, including principal commercial managers, project managers (highways design and operations), principal civil engineers, senior civil engineers and water mechanical engineers.

WINNING RACE FOR OLYMPICS

In December 2011, the Hammer-smith Flyover was closed following safety concerns. Investigations by Amey revealed corrosion of the steel tendons was worse than previously thought and that in some places entire cables had disintegrated.

The company was involved throughout the repair process. The pressure was on – the flyover had to be ready for the London Olympics in August 2012. Working closely with Transport for London, Amey developed supports that could be retrofitted to the structure so that the traffic could continue to flow. The collaborative approach adopted by Amey and their supply-chain partners

created a culture where innovation and ideas were welcomed from every level of the business.

Amey had early involvement with the contractor so the project team could get a head-start while designs were still being refined. Meanwhile, also as part of the integrated process, Amey teams at their International Design Hub in Birmingham were analysing detailed research and developing exactly the right support mechanisms for the flyover.

The whole process took less than 23 weeks instead of the 18 months to two years that such a project would normally require.

UK LEADING THE WAY WITH NEW STANDARD

January 2014 saw a milestone in the evolution of recognised best practice for asset management. The first international standard for asset management, ISO 55000, was published after three years of collaboration, debate and consensus-building between 31 countries, as **David McKeown**, chief executive of the Institute of Asset Management, explains



OPINION

The management of ageing assets is one of the most critical issues facing industry and government. In the UK, more than £250 billion needs to be spent over the next five years in addressing overdue renewals, and both government and industry are struggling with competing priorities, constrained resources and the difficulty of justifying what to do and when.

Assets have always been managed. Often this has been done well and consistently by far-sighted leaders, but "the way we do things around here" has not always survived changes. Sometimes, for example, in Victorian times, there was a prevailing ethos that saw the long-term view as good business management.

In today's complex and fast-moving commerce and industry, organisations are often subject to very different contexts and huge pressures to perform. Individual companies may be operating in many time zones and/or 24/7. They may have long and indirectly controlled supply chains or they may have outsourced much of their activity. More and more, people are starting to recognise short-termism as a real distraction – or worse. But what is this and how can it be avoided?

Then, there is the relentless pressure of quarterly results, often in public. These are real constraints and even government, particularly in the West, has adopted a commercial business approach to much of its activity and assets. The use of the "triple bottom line" is an attempt to use measures other than cash only.

One of the reasons that many people misunderstand asset management is that it is not about the assets. It is about managing assets

so as to derive value for the organisation. ISO 55000 defines an asset as an "item, thing or entity that has potential or actual value to an organisation".

An element that really differentiates ISO 55001 from other management systems is the need for a long-term view. Evidence shows that up to 30 per cent of the total cost of ownership can be avoided by better decision-making at the design/procurement /renewal points. Yet, despite the criticality and urgency of the situation, current decision-making practices in this area are often subjective, inconsistent and based on technical arguments rather than robust business-case justifications.



The right rules prevent initiative overload and allow the organisation to see why and how investment decisions have been made. So asset management increases the focus on transparent and consistent decision-making. This in turn requires appropriate information or actionable data. Some organisations have entirely separate records – or even incompatible computer systems – for financial and other asset data. So it is no surprise when they and their departments disagree.

A key principle of asset management is the "line of sight". Asset management translates the organisation's objectives into technical and financial decisions, plans and activities.

This theme is effectively cap-

tured in a thread running through ISO 55001, but the phrase "line of sight" itself did not translate very well into some languages, so it has been renamed "alignment".

The underlying theme of asset management, and the return on your investment in good management, is the assurance that your assets will fulfil their purpose in all respects and deliver the intended value.

As Ingo Agthe at McKinsey & Company says: "ISO 55000 will drive a new level of awareness for asset management and create a pull for new capability profiles in the job market."

The diagram, used in ISO 55000, helps many people understand quickly how the defined asset management system is only a part of asset management.

People do asset management. Without an appropriate culture and leaders who convince staff that they are committed to it, asset management cannot deliver its promise. This is why the Institute of Asset Management (IAM) is committed to developing people who have the necessary knowledge, understanding and tools to help their organisations thrive.

Perhaps the most important benefit of ISO 55000 is the consensus achieved by the participation of 31 countries, but those familiar with PAS 55 will find many familiar themes.

Sadly, many organisations will encounter asset management merely as a matter of compliance, perhaps because they wish to supply governments or asset owners that appreciate the real value of doing asset management. They will see it as a burden or cost and gain little or nothing.

But investors and asset owners are increasingly valuing compa-

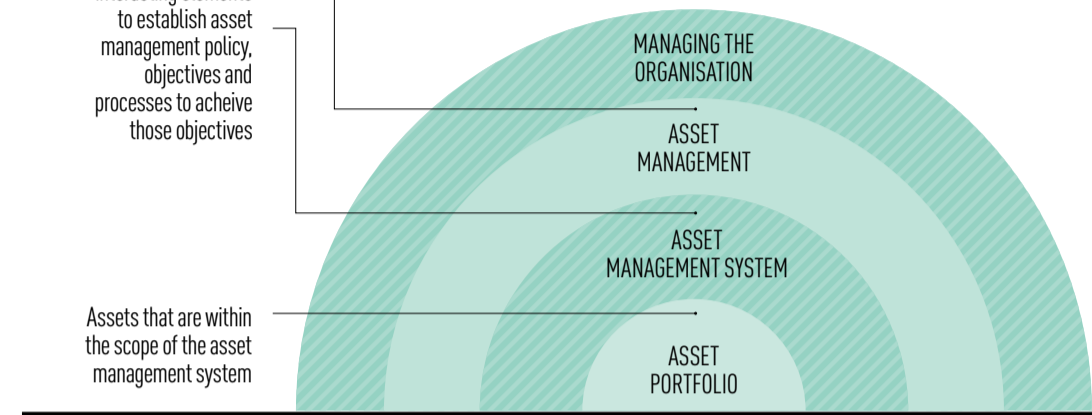
Co-ordinated activity of an organisation to realise value from assets

Set of interrelated or interacting elements to establish asset management policy, objectives and processes to achieve those objectives

Assets that are within the scope of the asset management system

ANATOMY OF ASSET MANAGEMENT

Source: Institute of Asset Management



nies not only using the balance sheet-profit and loss approach, but also the state of their assets and governing processes. So evidence of good asset management will soon be a routine input to due diligence, market-marking and share price.

We are already seeing early adopters gaining disproportionately, and we expect to see many blue-chip and world-class organisations strategically developing their expertise in order to distinguish themselves for excellent asset management and not mere compliance.



Asset management translates the organisation's objectives into technical and financial decisions, plans and activities

Asset management, done properly, is not additional work – it is the way you do your work.

Asset management has been widely acknowledged to have very significant financial, performance and sustainability benefits. The UK is proud to be at the forefront of this unfolding discipline, which emerged from the IAM's development of PAS 55 through BSI (British Standards Institution).

Well-managed organisations are now identifying benefits for themselves and this will increase rapidly.

Yet there are still many organisations that continue to work in functional silos, suffer from expensive short-termism or persist in confusing priorities and conflicting performance measures. Which are you?

As Keith Hamer at Sodexo says: "ISO 55000 can be a game-changer for both supplier and client, and not only for asset intensive organisations."

KEEPING UP STANDARDS

Nearly every organisation needs or wants to achieve more with its assets. Not only how to minimise downtime or lost production, but also how to spend money well to deliver value for the purpose of the organisation.

This is, perhaps, more obvious for physical assets, but government, investors and corporate decision-makers in every sector are increasingly subject to scrutiny of stakeholders – and reputation and brand are also assets.

Asset management is what organisations actually do in order to exploit their assets or realise value from them. A long time ago, the Institute of Asset Management identified the need for a common language to help any organisation do this, balancing risk, cost and performance in a structured way. The outcome was PAS 55, first published ten years ago. BSI PAS 55:2008, the revised version, became a "best-seller" globally. True international consensus has been achieved with the publication of the ISO 55000, 55001 and 55002 standards. ISO 55000 was introduced to meet real demand and defines the requirements, processes and framework for an organisation to achieve competence in asset management.

WORLDWIDE UK BLUEPRINT FOR INFRASTRUCTURE

The UK is at the forefront of private sector delivery and financing of infrastructure, and many countries have adopted British practices. But how successful is the UK model and is it always transferable?

Sarah Ahmad Tame investigates

EXPORTING UK PRACTICES

Established in the early-1990s under the John Major Government, the UK's Private Finance Initiative was the first systematic programme for the development of infrastructure projects under a public-private partnership (PPP). It was introduced as a way of bringing in private sector capital to fund major infrastructure projects. The underlying principles of the PPP model are threefold – private sector delivery, private financing and long-term asset management.

The UK model for development suffered intense public scrutiny

developing their own models." According to *IJGlobal*, 107 new PPP projects, across 28 different countries, secured financing in 2013 and there are a further 460 in procurement.

Canada was one of the first countries to adopt the UK PPP model in the 1990s and now has a well-established PPP market of its own. According to the Canadian Council for Public-Private Partnerships, as of June 2013, there were 102 operational PPP projects in Canada and 54 under construction. A further 41 PPP projects are also in the procurement stage.

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over its cost effectiveness and value for money for the taxpayer, and in 2012 underwent a review, resulting in a new approach to PPPs. The subsequent Public Finance 2 model attempted to address these issues by offering greater transparency, more efficient project delivery and a higher public sector equity share in projects. But despite its negative press, the UK PPP model continues to act as a blueprint for the development of infrastructure across the world.

Darryl Murphy, partner, global infrastructure practice, KPMG, says: "There has been an evolution of PPP internationally. A decade ago there were between six to ten countries doing PPP projects, now there are over 100

KPMG's Mr Murphy worked on one of the first hospital PPPs in Canada, the William Osler Hospital in Ontario, and he recalls that the hospital board and its legal advisers looked to the UK model for guidance. "They literally printed off a copy of the UK standard form contract as a reference point," he says.

In both contexts, the PPP model has helped to reduce the cost of developing infrastructure for the public sector. The objective of the model is to ensure greater cost-savings and greater service to the taxpayer, says Gershon Cohen, head of a multi-billion-pound infrastructure fund business, which was recently acquired by Aberdeen Asset Management. "It offers a low cost of capital for the

UNDERSTANDING GLOBAL PRIVATE PARTICIPATION IN INFRASTRUCTURE (PPI)

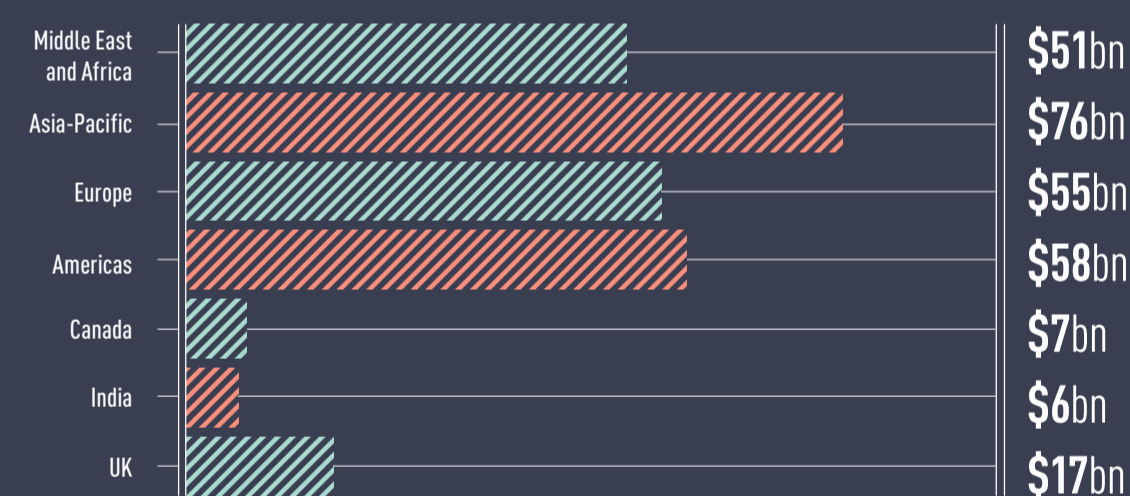
TOP TEN INVESTING COUNTRIES, 1990-2012 (US\$)

Source: World Bank/PPIAF, PPI Project Database



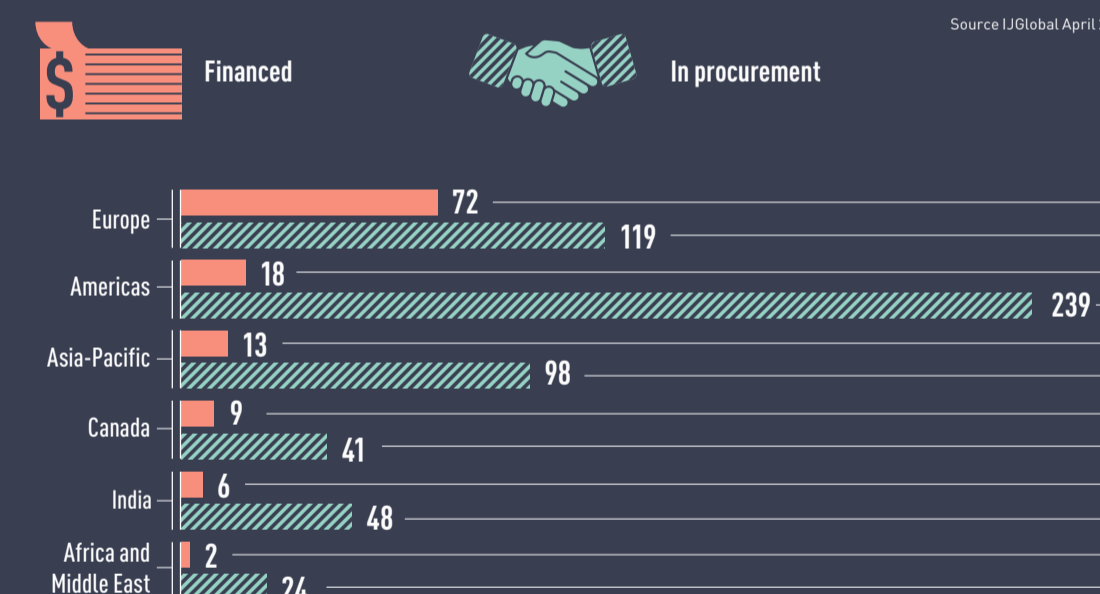
TOTAL PRIVATE SECTOR CAPITAL INVESTED IN NEW INFRASTRUCTURE PROJECTS, JANUARY 2013-APRIL 2014

Source: IJGlobal April 2014



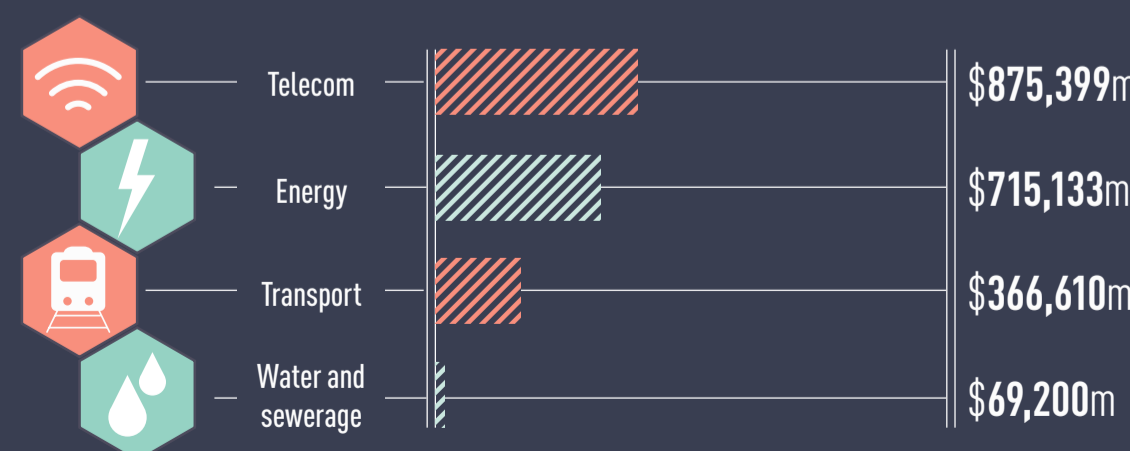
NUMBER OF PPP DEALS FINANCED, JANUARY 2013-APRIL 2014, AND THOSE IN PROCUREMENT

Source: IJGlobal April 2014



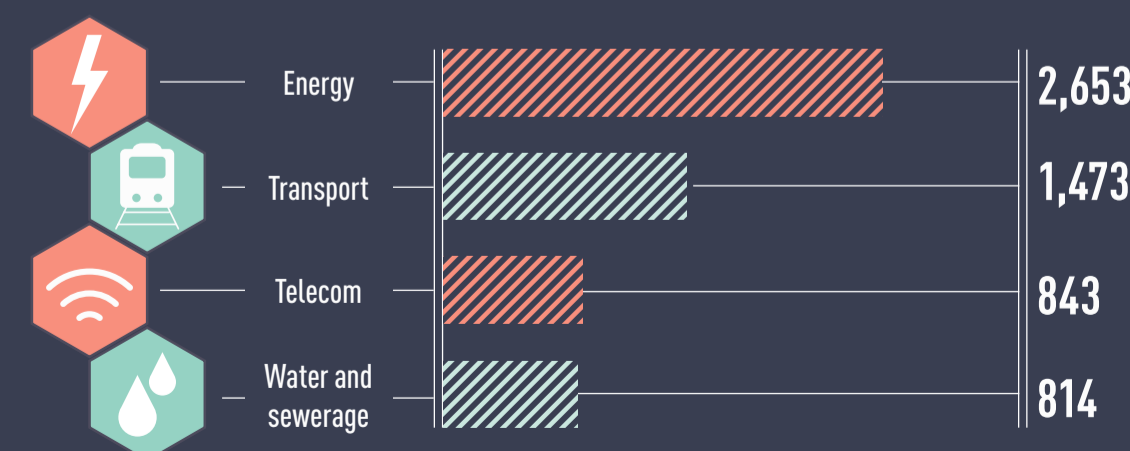
PRIMARY SECTORS IN PPI RANKED BY INVESTMENT, 1990-2012

Source: World Bank/PPIAF, PPI Project Database



PRIMARY SECTORS RANKED BY NUMBER OF PPI PROJECTS, 1990-2012

Source: World Bank/PPIAF, PPI Project Database



development of infrastructure and it transfers the risk to those best able to manage it," he says.

In addition, the PPP model encourages the public sector to consider the entire life-cycle costs of a particular asset and this is extremely valuable when determining value for the taxpayer over the lifetime of the asset.

On the surface the UK model has proved transferable, at least to countries with a similar culture and legal framework. But as more countries look to establish a PPP framework, it is increasingly evident that there is a no-one-size-fits-all model.

PPP is a hybrid relationship between the public and private sectors with each market looking to develop PPP through its own lens, says Mr Cohen.

"They [foreign governments] will look favourably at the UK model, but they won't be able to implant it entirely in the UK way. Instead they will adapt it to the way that fits their culture. Countries that have developed the PPP model have taken the

Asia. "The National Highways Authority of India was the poster child of PPP in Asia," says Mr Pat-tabhiraman.

But in the last seven to eight years, the Indian PPP system has been marred with corruption, and poor execution of projects has damaged the system and deterred investors. "There are land acquisition issues and new projects have suffered delays. The market context in India has led the PPP model to break down," he says.

For the PPP model to thrive, you need a strong private sector and a strong public sector. The private sector can create systems and can ensure consistency and timelines of project delivery, but it cannot create the environment for investment. "The PPP model works well where the government is willing to accommodate it," says Mr Pat-tabhiraman.

Corruption and political risk is also a factor that affects other emerging PPP markets. KPMG is advising governments in Africa, where Mr Murphy says we will see the development of a large PPP



The influence of the UK model remains really important – many countries look to the UK as a guide for infrastructure delivery

underlying principle of long-term asset management and private sector involvement to develop infrastructure."

For example, India is a country in which the PPP model is applied to almost all infrastructure development from roads, and rail to power, water, schools and hospitals. The Indian legal system is based on English law and so provides a good basis for PPP contracts. But the PPP model in India is slightly different to that in the UK.

India has huge requirements for infrastructure spending with the Indian government's twelfth five-year plan estimating the need for infrastructure expenditure of \$1 trillion. Around 50 per cent of this amount is expected to come from the private sector. There are currently 48 PPP projects in procurement in India.

Unlike in the UK and Canada, there is no central PPP unit in India. Instead PPPs are run independently by each state. "A central PPP unit would not work in a big country like India; it would create a bottleneck in delivery of projects," says Vijay Pattabhiraman, chief investment officer of Asian Infrastructure, J.P. Morgan Asset Management.

The PPP model has worked extremely well in the roads sector in India and the country's road programme is often cited as one of the best PPP programmes in

market over the next five years or so. The culture is very different in this region, coupled with increased political risk in some countries, so it will be difficult for a mirror image of the UK PPP model to develop, he says.

But those African governments that have been exploring the use of the PPP model to develop infrastructure, such as Ghana, Kenya and Nigeria, are looking to the UK as a guide.

Mr Murphy adds: "We are talking to the government in Ghana about the development of PPP and we say to them, if you want to develop a PPP model of delivery for your infrastructure then South Africa may offer some guidance, but they are keen to learn from the UK, even if the markets and challenges are, in fact, entirely different."

"The influence of the UK model remains really important – many countries look to the UK as a guide for infrastructure delivery."

As the world moves towards global standardisation, we will continually see countries borrowing from one another in terms of frameworks and practices. But standardisation in infrastructure delivery is unlikely as this stifles innovation and ultimately stymies flexibility. Instead we are likely to see the principles of private sector delivery and asset management founded in the UK adapted and adopted across the world. ■

World-class asset and safety management



ISO 55000 defines asset management as "the co-ordinated activity of an organisation to realise value from assets". This is an eminently sensible objective, but how do you go about maximising "the value" from what is after all a framework, guideline and set of standards?

To manage your physical assets, minimise risk, decrease whole-life costs, and improve asset performance, reliability and uptime, as well as improve safety, you need to provide more than just the logical system and framework that ISO 55000 encourages.

The Holy Grail is to implement Enterprise Asset Management (EAM) successfully at the heart of the organisation where it will define the organisation's operating model. This is where EAM delivers on the promises of the ISO 55000 framework.

"Many organisations believe that by simply procuring an EAM system they are doing just this, but it takes much more than just a 'vanilla' IT system hurriedly or gradually implemented across a few of your key asset classes or business units," says Andy Evans, chief executive of the Enterprise AMS Group.

With many organisations not understanding what they are truly setting out to achieve, what return on investment (ROI) they can realistically expect and what it will mean to every stakeholder from front-line workers to executives, getting to a world-class standard of managing your assets and safety just doesn't happen.

EAM is exactly that – managing all your assets through their entire asset life cycle for all the asset classes you are responsible for in a strategic, operational and tactical manner, which is optimal in approach. This includes every stakeholder that is touching the assets, whether part of the organisation or external contractors working on your assets.

It is more than strategic thinking; it is providing the organisation with an operating model that supports this. It is the optimisation of your processes to enable process productivity to provide visibility, flexibility and business advantage across the enterprise. It is about the staff, their competencies, and the tools and knowledge that enable them to work smarter and more innovatively in the drive for world-class performance, with a major focus on the ultimate stakeholder – your customer. It is the single line of sight or alignment across the enterprise from front-line staff to executives, with no manual intervention or manipulation of data.

Many organisations continue to invest heavily in systems, but ultimately remain disappointed at their ROI.

"Recognising all assets are definitely not the same, but that they can be managed in a single enterprise system is a light-bulb moment which not everyone has yet had. We often see vested interests working against the greater good of the organisation," says Mr Evans.

"Traditional IT departments quite like having multiple legacy systems, and a lack of a long-term joined-up strategy, from IT, finance and operational departments, can mean legacy systems get significant tactical investment to upgrade hardware and software.

"The sum of the tactical spend nearly always exceeds the cost of a large EAM implementation programme, but people rarely look at the total cost of ownership and the lost opportunity costs."

So how to avoid the disappointment? Ultimately it's all about combining a clear, executive-led asset management strategy, business processes optimisation, deep industry experience and knowledge of the assets you want to control. And managing them in a single EAM system integrated to best-of-



Your journey to world-class asset and safety management begins here...

breed technologies in mobile, GIS (geographic information system), reporting/business intelligence and integration into your operational systems.

And what about health, safety and environmental management? We believe this should be an integral part of the overall asset management approach, embedded in both your processes and system. Your workforce, contractors and the general public unfortunately have incidents while maintaining and

using your assets. Only by understanding who was doing what and when, and the performance of the asset, can you understand and manage an effective response and performance improvements.

At the Enterprise AMS Group we are bringing simplicity and understanding of how organisations can become world class in both asset and safety management.

We have IT EAM Industry Solutions built on IBM Maximo software. These include industry specific "accelerators" that fast-track the organisation to achieving its asset and safety management objectives.

Our Braid Consulting Division assists with the operational excellence, design and business transformation that is required using optimised frameworks and methodologies.

The Braid Technology Division are leaders in industry-specific asset and safety management systems,

these include business intelligence and reporting, and mobile solutions.

And our Braid Support Group provides system support and specialist training.

So why Braid? Because Braid is the joining together of all the elements that enable an organisation to become world class in asset and safety management.

These divisions all sit within the Enterprise AMS Groups Centre of Excellence and Innovation. This is used globally to assist clients with their journey to become world class.

For more information or to contact Enterprise AMS Group please visit www.eams-group.com



Our objective is simple: to enable organisations to become world class in asset and safety management

	<p>Braid CONSULTING</p> <ul style="list-style-type: none"> ◆ PA55/ISO5500 ◆ Asset Management ◆ Health and Safety ◆ Asset information/Management Strategy ◆ EAM Diagnostic/EAM implementation ◆ Business Transform/Change ◆ Operational Excellence ◆ EAM Methodologies and Frameworks ◆ Reliability and Performance ◆ Asset Management Systems ◆ Enterprise Architecture (TOGAF) ◆ Sustainability 	<p>Braid TECHNOLOGY</p> <ul style="list-style-type: none"> ◆ EAM Systems ◆ HSE Systems ◆ Business Intelligence and Reporting ◆ Mobility ◆ Visualisation and GIS Mapping ◆ BIM ◆ Predictive Analytics ◆ Integrators ◆ Reliability Centred Maintenance ◆ Technology Infrastructure ◆ Agile ◆ Reference Architecture 	<p>Braid SUPPORT</p> <ul style="list-style-type: none"> ◆ Enterprise Asset Management Systems ◆ HSE Management Systems ◆ Infrastructure ◆ Asset Operational Systems ◆ Training
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centre of excellence and innovation



INTERVIEW

■ You can tell a lot about Chris Sexton from his four-word Twitter profile: Crossrail-Royal Engineers-Saints.

Saints is a reference to Northampton Saints, the rugby team he played for in his youth.

The Royal Engineers was where he spent most of his career, rising to the rank of brigadier and chief engineer of the Army, following stints in Northern Ireland, the Balkans, Iraq and Afghanistan.

Crossrail, the £14.8-billion project that will run for 100 kms, linking Reading and Heathrow in the west, through new tunnels under central London, with Shenfield and Abbey Wood to the east of London by 2019, represents the culmination of his career. He is technical director of what is

the largest construction project in Europe.

A recent tweet from ChrisMSexton celebrated that fact that TBM Ellie – tunnel boring machine Ellie, one of eight 150-metre long machines – had just dug a record 72 metres of tunnel in a 24-hour period. The planned average is around 120 metres a week.

The record was set in April as the tunnelling broke into the new underground station at Whitechapel and the symbolic half-way point was reached.

"To be on time and on budget is very good news. We have some tunnelling still to do and other underground construction. Then there is the big switchover to fitting out the stations and installing the track, the ventilation, the

Chris Sexton is leading the engineering campaign for Crossrail



As technical director, he has to keep track of more than one million assets, where they fit in now and how they can be maintained in future

MOBILISING CROSSRAIL WITH MILITARY PRECISION

The former Army brigadier in charge of engineering the capital's Crossrail project gives **Raymond Snoddy** a progress report

overhead power," says Mr Sexton, who joined Crossrail in 2010 after three years as head of engineering at construction group Laing O'Rourke (Europe).

The Crossrail executive, whose responsibilities cover everything from engineering and digital mapping to signalling and sustainability, has one of the largest asset management jobs imaginable.

"A lot of my job is integration... it's making sure that the civil engineering, the railway engineering, the mechanical engineering all fit together, not only to create a railway, but also one that delivers the performance we are required to produce," he says.

As technical director, he has to keep track of more than one million assets, where they fit in now and how they can be maintained in future.

Mr Sexton has the relatively rare benefit of being involved in creating an entire railway from scratch. He is, therefore, able to plan the asset management from the outset rather than, as more often happens, much later in the process.

"We are going to build two railways. We are going to build a physical railway and we are going to build a digital railway, which is the information about those assets and how they work," he says.

As each stage of the physical railway is completed, then metaphorically, the relevant sections of the digital railway will be handed over in the form of large databases to the ultimate owners of the asset, Network Rail, London Rail and London Underground.

Along the way there is a single pot of data that can be accessed and used by all those who need it.

The existence of the digital railway will help greatly with maintenance. Equipment will not be replaced by timetable or through waiting for it to fail.

"We will be using remote monitoring of assets and so the assets themselves will be able to tell us when they are in need of replacement," says Mr Sexton.

He believes his Army background has been a great help in managing a project involving a total of 10,000 people, akin to the size of a group of hospitals or troops on exercise.

Sexton's responsibilities and the response has included setting up a tunnelling and construction academy; contractors have to set up apprenticeship schemes, with more than 300 signed up so far.

On the environment, strict targets have been set for air quality based on reducing diesel particulates from all plant machinery, and every contractor has to cut energy and construction consumption by 8 per cent during their part of the project.

Enormous stress has also been placed on safety with a "zero harm" policy – efforts that have been reinvigorated following the project's first fatality in March, apparently caused by a falling piece of concrete during tunnelling.

Looking forward Mr Sexton believes that the positive economic impact of Crossrail will be considerable, bringing 1.5 million people to within 45 minutes of central London.

"At the moment, if I want to go from where we are in Canary Wharf to Heathrow, I allow a couple of hours. With Crossrail, we are talking 45 minutes and 36 minutes from Heathrow to Liverpool Street," he says.

If HS2 goes ahead, as seems likely, then there will be the additional benefit of a skilled workforce from Crossrail who can move on to an even bigger project once they are no longer needed in London.

"I think the UK has demonstrated through the Olympics that we are capable of delivering a major project successfully and on Crossrail we are half way towards demonstrating the same," he says.

"It would be of enormous help to the UK economy if we keep a conveyor belt of such projects going," the Crossrail technical director adds.

Would he in turn move on the Crossrail 2, the proposed Chelsea to Hackney line supported by London Mayor Boris Johnson?

"If it gets authorised and funded, then possibly," Mr Sexton replies. ■



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NEW POWER ASSETS ARE FUELLING DEBATE

Financing new energy assets for nuclear and low-carbon power generation in the UK is at the centre of political debate, as **Olivia Gagan** reports



ENERGY

National power supplies and politics have long been awkward bedfellows. Governed by some of the strictest carbon and pricing regulations in the world, the UK energy industry is highly sensitive to political change. Aware of this, and of the growing need to create a cohesive plan for the country's energy future, the government has spent the past two years debating the best way to enable the estimated £110-billion investment that is needed for new energy infrastructure for the nation. As a result, the UK's new Energy Act gained Royal Assent last December. This legislation brings about wholesale reforms to the way in which energy assets are built and subsidised, and their power sold. A key aim of the new regime is to provide certainty

and stability to investors so that they can have faith that the new nuclear stations, solar farms and gas plants they build will remain financially secure throughout their lifetimes.

For the energy industry, such reassurance cannot come soon enough. The UK currently offers a somewhat complex and confusing environment for the development of new power assets. Existing gas-fired generators are being mothballed, due to tumbling coal prices from across the Atlantic making older, dirtier forms of power more economic.

However, these ageing power stalwarts, the UK's coal plants, are

also systemically being shut down to meet EU carbon regulations. New renewables projects are also being scaled back or abandoned as developers await more regulatory security from the state.

The new legislation must help to close this growing gap between the existing power plants, which have reached the end of their life cycles, and the construction of a new mix of nuclear, gas-fired and renewables projects that the government hopes will overtake them.

The lynchpin of the Act is the Electricity Market Review, which includes a package of new state support mechanisms designed to guarantee power producers a

84%

of people in the UK are concerned about future steep rises in energy prices

77%

support the use of renewable energy sources

Source: Department of Energy & Climate Change Public Attitudes Tracker, February

stable, predictable price for the energy they produce. If producers can guarantee returns for their investments, then power project development should increase, goes the logic. A huge part of effectively planning and managing physical assets is ensuring that they present an attractive bet for investors. Ease of use and clarity will be key to the success of power-market reforms.

Global head of law firm Hogan Lovells' infrastructure practice Adrian Walker says: "The new Energy Act can be made to work and give much-needed certainty to underpin investments. Of course, utilities will be at the heart of developing many of the new assets. But the government's success is going to be judged by how good it is at fostering speed and value for money. This tends to come down to how simple and scalable you can make things, and whether you give investors long-term certainty."

The prize for making the UK's new Energy Act a success is a healthy, thriving energy market. "When you get regulated markets right, the investors come running," says Mr Walker. "If you tinker for short-term political reasons, there tends to be a price to pay." As advisory firm Energised Environments' Jonny Clark has warned: "The UK supply chain could go anywhere in the world. If investment is flowing elsewhere,

because it's easier to do business, then that's where the supply chain will go."

A European Commission investigation into elements of the Electricity Market Review is ongoing. If the commission decides that the system does not provide the UK taxpayer with good value for money, then it may well be back to the drawing board for policymakers. The key concern that arises out of the regulatory rollercoaster that the industry has already been subjected to, by the creation of a new electricity market, is how this will affect the flow of capital into new energy projects in the UK.

According to Scottish and Southern Energy's head of policy Dr Keith MacLean: "We now have a whole series of known unknowns that have been created... people want to have information to present to their investment committees before they can take projects forward. It's a very brave investor that goes ahead thinking they know what the outcome is going to be in a very complicated jigsaw puzzle. At the moment we barely have an outline of the corner pieces."

Such scrutiny is to be expected, however, and secondary legislation is set to be added to the Act, which may answer some of the concerns raised by industry. Rising tensions in Russia and Ukraine have added further impetus to ensure the UK has a solid plan to develop its own secure, independent sources of energy. As ever, politics looks set to be the driving force behind power development for a long while yet and the UK's new landscape for energy development will be predicated on laws that can be relied upon. ■



The new Energy Act can be made to work and give much-needed certainty to underpin investments

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CASE STUDY

NUCLEAR COMEBACK AT HINKLEY POINT C

BREAKDOWN OF HINKLEY C COSTS

£10.2bn

CONSTRUCTION COSTS

£2.2bn

CONSTRUCTION CONTINGENCY

£1.6bn

INTEREST ON DEBT DURING CONSTRUCTION

£2bn

NON-CONSTRUCTION COSTS SUCH AS SITE LICENSING AND PUBLIC CONSULTATIONS

SOURCE: POWER FROM NUCLEAR

HINKLEY C FACTFILE

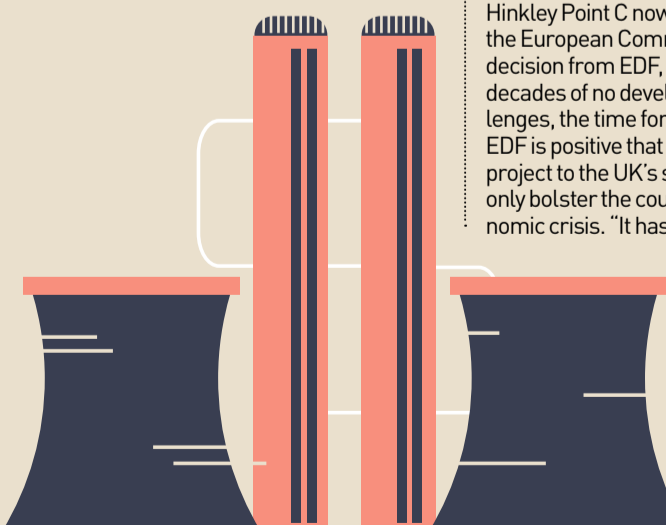
25,000

JOB WILL BE CREATED

7%

OF THE UK'S ELECTRICITY DEMAND WILL BE MET

SOURCE: DEPARTMENT OF ENERGY & CLIMATE CHANGE



The planned Hinkley Point C nuclear plant will be a physical asset of massive importance to the nation. The first civil nuclear power station to be built in the UK for two decades, the project will galvanise billions of pounds of investment and mobilise a large part of the construction supply chain.

Developed by French utility giant EDF Energy, this £16-billion undertaking will be reliant upon strong asset management. The project demands decades of funding, both from the developer, lenders and the state, and ensuring that the new nuclear power station is built in the most cost-effective and risk-mitigated manner possible will be key to keeping the UK public on side.

Part of reducing risk is ensuring that Hinkley Point C is built on time and on budget. For a project of such national – and international – significance, having the correct frameworks in place will be essential for EDF's undertaking to be a success.

These frameworks span regulation, finance, construction, maintenance and decommissioning. And nuclear safety will be a key concern. Legal firm Norton Rose's nuclear lead Peter Hall says: "Post Fukushima, the industry took a long hard look at safety issues and that meant the introduction of further safeguards, which costs money. But if the result is increased safety, that can only be a good thing." As one of the biggest civil engineering projects in the UK in decades – on a par with Crossrail and the Olympic Park – the new nuclear station also requires a robust, skilled supply chain that can meet the demands of constructing such a complex asset.

The first generation of UK nuclear professionals is now reaching retirement age, but as Mr Hall points out, the UK still has a strong reputation for nuclear development. "We exported our expertise during UK nuclear's dormant years. The challenge for Hinkley Point C is to ensure that UK plc gets its fair share of the work that is available," he says.

Beyond construction, asset management spans the lifetime of a reactor. At the end of the nuclear energy production life cycle comes the thorny issue of radioactive waste storage. The government has been trying to find a county willing to host an underground disposal facility for several years. Cumbria County Council has been the latest to refuse, withdrawing from the process last year. At the time, Energy Minister Ed Davey warned that it is "absolutely vital that we get to grips with our national nuclear legacy – the issue has been kicked into the long-grass for far too long".

That said, public and political consensus is at a high for the technology. With energy demand only set to increase and as European Union legislation forces existing, high-carbon power plants to shut down across the country, there is a pressing need for a reliable baseload power project that can be relied upon to keep the lights on.

Hinkley Point C now awaits approvals both from the European Commission and a final investment decision from EDF, both slated for this summer. After decades of no development and despite the challenges, the time for new nuclear, it seems, is now. EDF is positive that the addition of this mammoth project to the UK's stable of generating assets can only bolster the country's recovery efforts post-economic crisis. "It has the potential to help rebuild the

country's industrial stamina and will be a catalyst for the renaissance in nuclear skills in the UK," EDF says. "Experience built on the project will create high-value jobs and enable UK businesses to compete around the world to support new nuclear projects already underway or planned for the future."



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STAYING AHEAD WITH PREDICTIVE ANALYTICS

Optimised maintenance programmes and workflow systems can be significantly enhanced with cutting-edge technology, writes **Bryan Betts**

TECHNOLOGY

Once upon a time, asset management software was all about the workflow involved in keeping tabs on things – tracking their location, when they were last serviced or updated, their current value and so on. All that is now changing, thanks to technologies such as big data analytics and machine-to-machine communications.

The result is a new breed of holistic asset management tools that make it possible to look forward, and manage risk and performance. They use predictive analytics which can tap and correlate reservoirs of data right across an organisation and beyond, not only to schedule preventative main-

tenance, but also to predict the possible and likely consequences of failures and assess how best to minimise them.

"There's a lot of drive to put sensors on things and generate real-time data," says Steve Ehrlich, senior vice president of marketing at asset visualisation specialist Space-Time Insight. "The problem is that generates huge amounts of data – you used to have one ping a day, saying 'Here I am', but now it can be at sub-second intervals. Then the question is, I've collected all this data, now what do I do with

it? How do I visualise it and what do I do then?"

"The key with big data is to convert it to 'little data' so, for example, you don't want all the normal conditions, you want the abnormal ones. It's the unread meters, the planes approaching capacity.

"So the drive now is to simplify it on to a single pane of glass or dashboard, so you can see what asset it is, what it's doing, how that's different from what it did before and what factors are involved, such as weather, temperature, an accident. Then, and most importantly, it's looking forward to see what will be doing tomorrow or a year from now, and what else might be affected."

For example, if an electrical transformer fails suddenly, correlating your asset data with weather reports could guide your response by showing it was in the path of a thunderstorm. Then, analysing your network will show which customers are affected, and if your analytical tools also support what-ifs, you can look at the most likely outcomes and see how adjusting your response could change them.

"Analytics is very important, and it's only going to become more important – it is essential for pre-



Changing business models, aided by digital technology and optimised asset management, has seen Rolls-Royce sell serviced flight hours, rather than engines

dictive maintenance, for example," agrees Reid Paquin, a senior analyst with the Aberdeen Group. However, while companies, big and small, want to sell you software to deal with this challenge, he warns that it is much more than just a software problem.

"Some other things have to be in place," he says. "For example, you have to have the right organisational structure, with buy-in at all levels from management to the employees – especially the employees because, if they don't trust the system, they won't use it and it's going to be wasted. You also need employees with an analytical background – that kind of talent in the organisation is often overlooked.

"Then it's because there's so much data being collected and a lot of the time the systems are not interconnected. It really is about the data – it must be correct and up to date, you must have access to it when you need it."

Collecting, cleaning and correlating this data is a major part of this classic big data operation. As well as different systems having different formats, the data may also come at different times and in different contexts, for example sub-second machine performance data versus hourly weather reports versus ad-hoc feedback from field service teams.

"The technology is all out there.

The aerospace industry has been doing this for decades, for instance, because the cost of not doing it in that industry is enormous," Mr Paquin says. "Centralising data has been getting easier because the technology vendors realise they need to integrate with other applications. The market has realised how critical this is."

He adds that applying predictive analytics to assets is "not a new technology, it's a new application. The company may already be doing analytics, for example in its supply chain network, production planning or on the CRM [customer relationship management] side". As a result, the organisation may already have the necessary talent and understanding, capable of being redeployed in this new area.

Also vital is getting these predictive insights up to the board in a comprehensible form, says Dr Achim Krueger, vice president for operational excellence solutions at software providers SAP. "Your assets are much more intelligent now and are producing much more information, and your board needs sight of that," he says. "Technological forecasting of failure was done years ago," he adds. "Now you have to put that into a business context – how it affects the level of spare parts you need or your negotiations on maintenance contracts – and present it to decision-makers in an understandable form." For instance, 3D models could replace lists, with parts of the plant coloured by risk level.

The importance of executive insight is underscored by the advent of ISO 55000, the international standard for asset management. Derived from PAS 55, a specification for the optimised management of physical assets, ISO 55000 was approved in January. "It's still the same paradigm – holistically managing assets, with a focus on risk and performance, but ISO 55000 raises the importance to board level," Mr Krueger says.

He adds: "Even more important is that this goes hand in hand with changing business models from product to service orientation. For example, Rolls-Royce now sells flight hours, not engines, but the aircraft operator is still liable. So there is a need for much more horizontal integration and information sharing."



A new breed of holistic asset management tools make it possible to look forward, and manage risk and performance

17bn LITRES OF WATER SUPPLIED TO UK CUSTOMERS EVERY DAY

16bn LITRES OF WASTE WATER AND SEWAGE TREATED EVERY DAY

SOURCE: WATER UK/DELOITTE

STOP WATER GOING DOWN THE DRAIN

The water industry is facing a near-perfect storm of rising demand and supply under severe pressure, as **Jim McClelland** reports

WATER

Imagine a business where availability of raw material is unpredictable and unable to keep pace with rising demand, customers mostly take supply for granted and are wasteful in their consumption, plus the system – albeit improving – loses up to 27 per cent of your product. Welcome to the world of water.

The average person in the UK uses more than 150 litres of water a day, with this figure rising by about 1 per cent a year since 1930. We are each using almost half as much again today as individuals were in the 1970s and there are now more of us. Demand is a problem.

This problem is passed directly on to the supply and delivery networks, asset management and maintenance teams. Going round the UK system daily are 17 billion litres of water supplied to customers and 16 billion litres of waste water and sewerage returned to be treated. In London and the Thames Valley, the pressure is quite literally on 20,000 miles of water pipes, some of which are ageing, 150-year-old cast-iron conduits.

While leakage rates have improved on average by more than 35 per cent since industry privatisation and the highs of the mid-1990s, annual figures still exceed 20 per cent for nearly half the utility companies in England and Wales.

As well as responding to the 2013 Water Bill, the water industry is now working to deliver on its current five-year Asset Management Plan (AMP5 2010-15), while preparing for the next wave (AMP6 2015-20), plus the regulator's Ofwat Periodic Review (PR14) and price limits later this year.

To complete the near-perfect storm of challenging delivery circumstances under which water asset managers must operate, climate change impacts and extremes of weather are headline news. From flooding to drought, deep freeze to heatwave, these events carry implications not just for peak performance of assets, but also for their condition going forward.

Overall, water companies will invest some £5 billion over the next 12 months and their contribution to the UK economy in 2012-13 has been calculated at £15 billion. During the worst period of the recent floods, some water and sewerage companies were spending around £100,000 a day protecting assets, such as treatment plants, and keeping sewers flowing.

Business as usual is not a sustainable option and according to Neil Dhot, head of corporate affairs at Water UK, while long-term investors in the water sector understand the implications of climate change adaptation and resilience planning, the future is as much about change management as asset management.

"Water companies will continue to provide the billions of pounds of investment needed each year to manage, maintain and create new assets required," says Mr Dhot. "But they also acknowledge the need to focus on different and innovative new ways of providing services and protecting the environment that don't necessarily

involve big capital and infrastructure projects, for example through greater emphasis on catchment management."

The Infrastructure Carbon Review, published by the Treasury last year, effectively charges the construction industry with delivering much of the targeted decarbonising of future water networks.

However, different speed, if not conflicting agendas, appear in play, as director of sustainability at Balfour Beatty Construction Services UK Paul Toyne explains. "Construction has been addressing mitigation of carbon emissions, government has set carbon budgets and we have made much progress," he says. "In comparison, the pace of adapting our infrastructure for future climate change has been slower and given less focus. We need to do both."

According to Dr Toyne, a strategic, cross-sectoral approach to such systemic change must start with rethinking water-use priorities, if future performance is to match sustainable quality, cost and resilience expectations.

"Do we really need treated water to flush toilets? Tackling this issue would unlock significant efficiencies – the challenge is designing the system to do this at the same time as keeping industry and society supplied," he says. "We need to decouple greenhouse gas emissions from the energy input, and think really hard about what and who needs treated water."

If associated behaviour-change represents the missing link between resource scarcity and stewardship, perhaps it is time this summer to spare a thought for the asset management professional as you turn on the lawn sprinkler and consume 540 litres of water an hour.

150 LITRES OF WATER USED EACH DAY BY THE AVERAGE PERSON IN THE UK

1% AVERAGE GROWTH IN CONSUMPTION EVERY YEAR SINCE 1930

SOURCE: WATERWISE

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