

# A2

NEW DIMENSIONS FROM ARUP | NO.6

## LEADING FROM THE FRONT: HOW SIX ORGANISATIONS ARE RESPONDING TO THE BIG ISSUES



CISCO | INTERCONTINENTAL HOTELS GROUP | RREEF INFRASTRUCTURE  
LONDON DEVELOPMENT AGENCY | DUBAI AIRPORTS | STANHOPE

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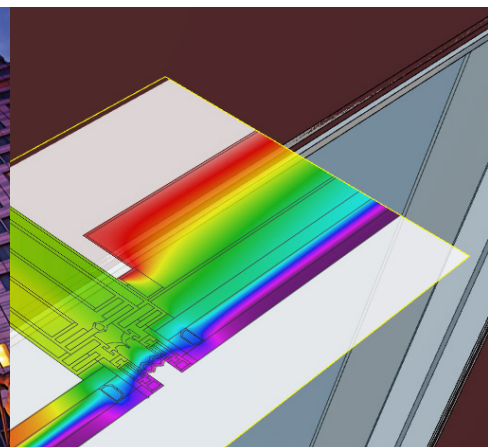
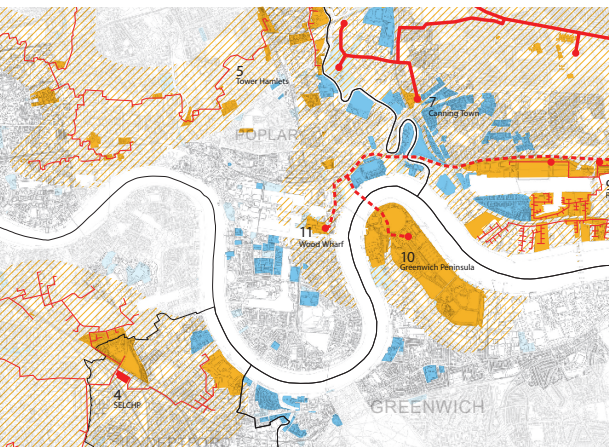
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## NOW, NEW AND NEXT



“Survival is everything, but those organisations who are able to lift their view beyond the immediate challenges, will be at an immediate advantage.”

*Welcome to A<sup>2</sup>, the business magazine from Arup.*

It goes without saying that these are unprecedented times. We know the causes, the symptoms are evident, the cures less so. For some organisations, however, the future is looking brighter and they are proceeding with a sense of responsibility, optimism and confidence. Through a combination of wise strategic choice, innovation, prudent economics, optimisation and the pursuit of ‘better’, these organisations stand out as exemplars. In this issue of A<sup>2</sup>, we interview some of these and profile the leaders who are driving, and delivering, real progress.

From a low carbon London (page 23) to opportunity and innovation in the property industry (page 14) - and from connected technology (page 20) to finance solutions to beat the credit crunch (page 9), these select interviews offer us an insight into the approaches and solutions that are setting these organisations and their leaders apart.

At Arup, under our newly-appointed Chairman Philip Dille (see page 5), we are working harder than ever to help our clients not only survive the recession, but thrive in the longer term. Times might be tough now but what comes next, surely a shift to a resource efficient, low carbon and more resilient age, is very exciting; as we see here from Cisco (page 20) and the London Development Agency (page 23).

Survival is everything, but those organisations who are able to lift their view beyond the immediate challenges, will be at an immediate advantage. These interviews, explain why. Enjoy A<sup>2</sup> and do share your views with us.

*Alan Belfield, Chair,  
Global Consulting.*



# News

## ARUP APPOINTS NEW GROUP CHAIRMAN

*Philip Dilley reinforces the firm's market focus*



1 Arup Chairman, Philip Dilley.

On 1 April 2009, Philip Dilley began his term as Group Chairman of Arup. He marks his appointment by reshaping the firm to focus on the four distinct markets of Energy Industry & Resources; Property; Social Infrastructure; and Transport – a natural evolution of changes set in motion by previous Chairman, Terry Hill.

“Our focus on these four markets will reinforce the kind of joined-up thinking that is crucial to serve the increasingly complex needs of our clients and communities”, Philip explains. “Clients today are looking for solutions, not just services. We have all of the necessary skills to offer elegant and efficient solutions across all four markets.”

Most recently, Philip was head of Arup's Europe and Middle East Region, which he saw double in size to contribute, today, nearly 50% of the firm's global earnings. He actively

encouraged diversification and a geographic spread that is paying off as some markets retract in today's economic climate. Philip was instrumental in re-establishing Arup's presence in the Middle East where Arup operates a successful business model that brings a new quality benchmark to the region.

Terry Hill steps aside having completed his five-year term as Chairman and goes on to lead the firm's new Transport market. “The last few years under Terry Hill's leadership have been nothing short of extraordinary,” comments Philip. “During his term our global influence has rocketed, and some of our highest profile projects such as the Channel Tunnel High Speed Rail Link and the ‘Birds Nest’ and ‘Watercube’ for the Beijing Olympics, have given us an unprecedented public profile. I hope I can continue his legacy in the challenging years ahead.”

## EXISTING BUILDINGS SURVIVAL STRATEGIES

*Making the most of what you've got*

In a challenging economic climate, maximising the potential of your buildings now could deliver superior financial and environmental performance in the future. On 3 March, Arup launched the Existing Buildings Survival Strategies guide to help clients revitalise tired assets and reduce operating costs. The guide includes case studies, a five-step plan for building owners and a list of 195 possible initiatives to help them decide what is best for their building and their business.

“Sustainability is often treated as essentially a design issue,” says Arup Director Chris Jofeh, “but in today's economic climate it's a business survival issue. Arup's skills can help people make their buildings work harder for them in support of their business objectives – whether they want to maximise returns, increase the value of their assets or cut operating costs. We can also help owners prepare for the legislation that is on the way, which will increasingly penalise energy-guzzling buildings.”

Part of the Existing Buildings service is a financial impact tool developed by Arup's transaction advice specialists in the UK, USA and Australia. This tool helps building owners to prioritise and focus interventions to match their business needs.

“The Existing Buildings service offers a systematic approach to retrofitting and refurbishment, allowing building owners and operators to identify quick wins and implement them right away,” he continues. “Savings can then be invested in longer-term interventions, including anything from



2 Arup Fitzrovia Phase 1, London, UK. Commercial office building constructed in the 1970s. Phase 1 involved consolidating two existing buildings and the addition of a new three-storey block, which was linked to the existing buildings by an atrium.

freeing up usable space to improving energy performance or workplace productivity.”

Chris Jofeh and his team are now rolling out a series of client seminars and workshops across the UK.

For more information about the seminars or to request a copy of the Existing Buildings guide, please email [a2@arup.com](mailto:a2@arup.com).

# HEATHROW HUB UPDATE

## *Arup gains cross-party support*

Arup's Heathrow Hub proposal to extend the High Speed 1 (HS1) railway line from Central London to Heathrow Airport, and connect the airport to the national rail network, continues to receive a great deal of public attention.

In February 2009, Theresa Villiers MP, the UK's Shadow Secretary of State for Transport, reasserted her Party's support for the proposal in the Rail Review, a policy document many consider to be a precursor to the manifesto. In it, Ms Villiers stated "A Conservative Government would back the innovative proposal put forward by the engineering firm Arup, to link Heathrow into the main rail network and a high speed link to St Pancras."

Later that same month, on a visit to Arup to address an audience of business leaders from across the Midlands, Ms Villiers MP outlined why she supported the proposal. "The Arup scheme would significantly assist in raising the proportion of passengers using public transport to access the airport", she explained. "The Arup proposal also contains an ambitious plan to provide a high speed rail connection to London and the Channel Tunnel. Combine that with the Conservative proposal for a high speed line going north and the result is massively improved transport links between the West Midlands and the rest of the world with a new high speed rail link from Birmingham to Heathrow."



The proposal now has cross-party support. Geoff Hoon MP, the Secretary of State for Transport, confirmed the Government's support for the proposal in a speech in January. Addressing the House of Commons, he called for "A new line approaching London via a Heathrow international hub station on the Great Western line, to provide a direct four-way interchange between the airport, the new north-south line, existing Great Western rail services and Crossrail into the centre of London."

Peter Gist, who is leading the firm's Heathrow Hub project, comments "We believe Arup now has a unique opportunity to overcome what has become the very British divide between our rail networks and international airports."

Under the firm's proposal, a new multi-modal transport interchange located 3.5km due north of Terminal 5 – the Heathrow Hub – would play host to a major new 12 platform station on the Great Western Main Line. This station would be linked to HS1 by new rail infrastructure and enhanced existing infrastructure – including a 24km tunnel.

High Speed 2 Ltd (HS2 Ltd) – the company set up by the Government to develop plans for the implementation of high speed rail – has invited Arup to join them in a working group specifically to look at the Heathrow Hub concept.

"This is a very exciting time," continues Gist. "Arup's campaign to place high speed rail on the political agenda has been successful. Now we must ensure our proposal, to link Heathrow to Central London with HS2, is progressed as the first important step in delivering an extended high speed network that will cover the United Kingdom. Only a direct link will secure Heathrow's position as Europe's premier hub airport."

HS2 Ltd is set to outline its recommendations to Government on a high speed route to the West Midlands in December 2009.

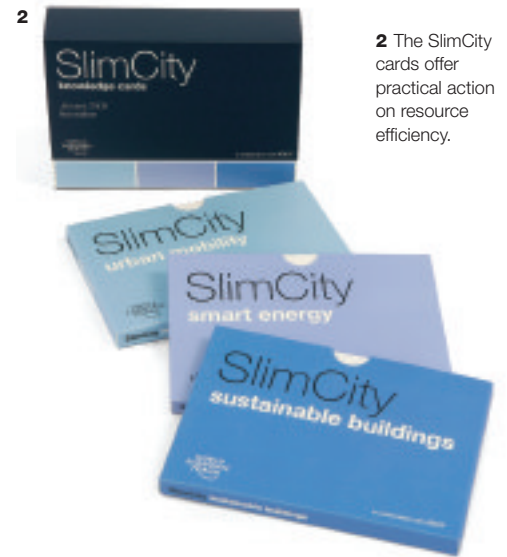
# HeathrowHub

The logo for HeathrowHub features the text 'HeathrowHub' in a sans-serif font. To the right of the text is a green graphic element consisting of a curved line that starts under the 'H' and ends under the 'B', with a small arrowhead pointing upwards and to the right.

1 On a recent visit to Arup, Theresa Villiers MP outlines her support for Arup's Heathrow Hub proposal.

# SLIMCITY

## *Arup at Davos*



2 The SlimCity cards offer practical action on resource efficiency.

The World Economic Forum's SlimCity initiative provides a global, risk-free platform where Mayors and the private sector exchange solutions to deliver resource efficiency at city level. As Knowledge Partner to the Forum, Arup researched, designed and produced a series of ground-breaking cards to inspire committed action.

Launched at Davos, at the Annual Meeting of the World Economic Forum in January, the cards deepen awareness of the role cities can play in bridging the transition towards sustainability. To achieve this, each of the cards showcases outstanding exemplars from around the world. The cards are divided into three themes to reflect SlimCity's current focus on urban mobility, smart energy and sustainable buildings. They were researched with the collaboration of the Forum and their constituent members.

In producing the SlimCity cards, Arup's Foresight and Innovation team drew upon their experience researching their on-going Drivers of Change programme – identifying issues most likely to have a major impact upon society and business. "Together the cards constitute a unique record of global best practice in cities" explains Marcus Morrell, a Senior Analyst from Arup's Foresight group. "They highlight solution-oriented actions and policies that cities can adopt now, taken from less-economically developed countries as well as from the developed world. They provide city leaders and their administrations with practical solutions to many of the complex problems they currently face." Evidently, it's an approach that has been well received.

The SlimCity cards – which are available from mid-April – also form the basis of Arup workshops to support and encourage strategic thinking in cities. For more information, contact [a2@arup.com](mailto:a2@arup.com).

# DESIGN FOR HUMAN PERFORMANCE

*Conference explores how people-centred design creates value*

Hosted by Arup and Leeds University Business School, 'Design for human performance' brought together experts from across industry and academia to explore how incorporating human psychology into design can deliver real value – from more productive, greener factories to safer forms of transport.

"Design and human psychology have huge roles to play in delivering improved human and organisational performance," says John Miles, member of Arup's Group Board. "It's a vital area of consideration as businesses come under increasing pressure to maximise the productivity and efficiency of their workforces. Through this event, Arup was able to bring together some of the leading thinking in this field."

Held on 26 February at the Royal Society in London, the day's three sessions focused on productivity and well-being, sustainability, and human movement, safety and security. Delegates discovered how simulation can be used to inform design to help passengers board trains more efficiently. They saw how factories of the future can deliver more efficient production. And they joined the debate as experts asked: are buildings getting 'better'?

Led by specialists from organisations including Rolls-Royce, Arup and Leeds University Business School, speakers shared the results of cutting-edge research, explored innovative models and technologies, and evaluated real-life examples of how informed design can add real value across a broad range of sectors.

Presentation material from the conference is available on request. For more information, please email [a2@arup.com](mailto:a2@arup.com).



3 Alan Marsden of Arup addresses the conference.

4 The conference brought together delegates from industry and academia.

# ARUP STUDY SHOWS PATHWAY TO 80% EMISSIONS REDUCTION

*Can the Thames Gateway meet climate change targets?*

On 26 November, the Department of Communities and Local Government (DCLG) published a feasibility study examining how to reduce greenhouse gas emissions (GHG) in the Thames Gateway. Conducted by Arup and Turner & Townsend, the study demonstrates that continued growth in the region could be accompanied by an 80% cut in emissions from 1990 levels provided that challenging emissions reduction strategies are implemented at national, regional and local levels.

The study is the first ever to look at GHG emissions based on life-cycle assessment for an urban area that has mature infrastructure and is earmarked for long-term growth. Arup's integrated resource modelling specialists worked with technical experts from across the firm to consider how everything from demand and supply of energy in buildings to logistics transport would affect emissions.

The project established different emissions reduction scenarios. Without intervention, they predicted that the Thames Gateway emissions could double by 2050. With the highest level of intervention, the area could achieve slightly more than the 80% emissions reduction target set out in the Climate Change Act.

"The study shows the importance of working at a strategic level to deliver an 80% emissions reduction," says Neil Grange, an Associate in Arup's sustainability consulting team. "Achieving this reduction across the UK will require a coordinated approach and this study will help shape the thinking."

Arup's model for the Thames Gateway predicts that the most effective interventions are to switch to renewable energy sources, use community energy systems, and to introduce and enforce zero carbon performance standards for new and existing buildings.

Copies of the feasibility study are available from [www.communities.gov.uk/publications/thamesgateway/lowcarbon](http://www.communities.gov.uk/publications/thamesgateway/lowcarbon).





# THAMES GATEWAY INSTITUTE

*Leading sustainability research*

On 2 February, Arup, the Thames Gateway Institute for Sustainability and Tongji University signed a Memorandum of Understanding (MoU) to promote collaboration on research in sustainable design and construction of the urban environment.

The MoU formalises the shared intent of the UK and China to collaborate on sustainability and heralds the establishment of sustainability research institutes in both countries. It will ensure that together the UK and China become leaders of the environmental technologies industry – already worth £25bn to the UK economy alone (Source: UKTI).

In the UK, the Thames Gateway Institute for Sustainability will develop, test and demonstrate technologies that enable people to live and work more sustainably. An independent organisation supported by both the public and private sectors, the Institute brings together business and academic organisations to work on practical innovations that both anticipate and respond to public and commercial needs.

Jeremy Watson, Director of Global Research at Arup and board member of the Institute, comments: “Arup is actively involved in China’s eco-city project, together with partners such as HSBC and Sustainable Development Capital LLP. We are bringing our experience to the Thames Gateway Institute for Sustainability, with the aim of establishing a global network to share best practice in environmental technology.”

A number of early research projects are focusing on construction, energy and waste. These include a two-year study to identify the most practical and environmentally-friendly green roofs for the London climate and a pilot project in north



**1** Terry Hill (standing, left) and Jeremy Watson (seated, centre) at the signing of the Memorandum of Understanding (MoU) between Arup, the Thames Gateway Institute for Sustainability and Tongji University.

**2** A successfully established green roof in London.

Kent to determine the most effective way that existing homes can be retrofitted to reduce residential carbon emissions.

For more information, please visit [www.instituteforsustainability.co.uk](http://www.instituteforsustainability.co.uk).

## NEW TOOLS TO TACKLE POVERTY

*Research and model addresses key sustainability issue*

Poverty reduction has been identified as a crucial part of achieving international development and sustainability goals. The latest Drivers of Change research and a new software tool from Arup will help organisations understand the issues surrounding poverty and the potential for infrastructure to alleviate it.

Published in February, Arup’s most recent set of Drivers of Change cards focuses on the social, technological, economic, environmental and political issues which affect individual and social well-being. The research aims to raise awareness and understanding of the multi-faceted nature of poverty, as well as informing the firm’s international development work.

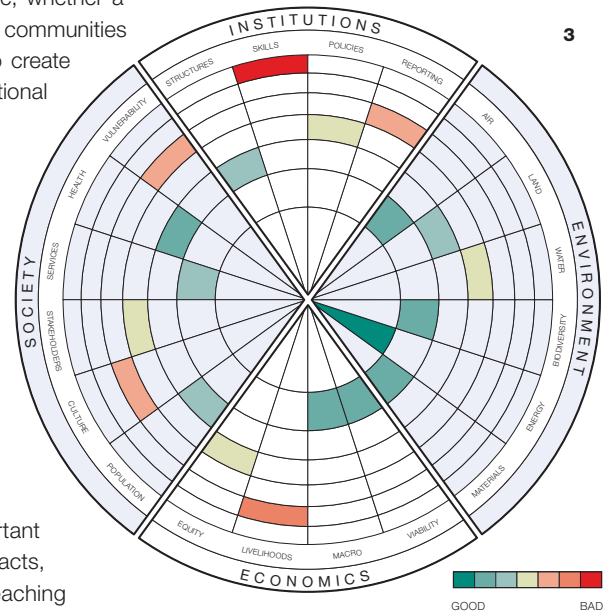
Lack of infrastructure is a priority in tackling poverty since access to water, energy, healthcare, education and markets enables communities to move beyond survival to self-sufficiency. Equally, effective services, facilities and transport links underpin equitable economic growth.

To help deliver sustainable ‘pro-poor’ infrastructure, Arup and Engineers Against Poverty are launching ASPIRE: an integrated planning, monitoring and evaluation model for assessing the sustainability and poverty reduction performance of infrastructure projects in developing countries. It is used to identify gaps in project briefs and to help engineers and other project stakeholders understand their

work in context. For example, whether a new road will displace local communities or provide an opportunity to create livelihoods, and if the institutional capacity exists to operate and maintain the facilities once built.

Dr. Priti Parikh, a Senior Consultant in Arup’s international development team, comments: “It has now become a standard good practice for planners and engineers to identify and mitigate the environmental impacts of their proposals. However, it is equally important to recognise the social impacts, and ensure these are far reaching and equitable in order to achieve a well-balanced society.”

For more information about the Drivers of Change research series or the ASPIRE tool, please contact [a2@arup.com](mailto:a2@arup.com).



ENGINEERS AGAINST POVERTY | ARUP

**3** An example project assessment using ASPIRE.



# INFRASTRUCTURE: MONEY MATTERS

**A stable, predictable income stream over the long term: that's what airports, toll roads and utilities represent for today's private equity and pension funds. But will the credit crunch bring the boom in infrastructure investment to an untimely end?**

*Steven Lloyd, leader of Arup's transaction advice team talks to Hamish Mackenzie, a Managing Director at RREEF Infrastructure, the alternative investment management division of Deutsche Bank AG.*

“Now the maximum deal size is closer to £1bn, because banks aren’t underwriting. So you need to work with a club of banks and there are limits to the manageable size of a club.”

When the established order of the financial world has been turned on its head, it shouldn’t come as a surprise to find that the new hot property among investors is not new technology at all, but good old bricks and mortar. The new dot.com is traditional infrastructure: privately-run toll roads, railways, water companies, airports, hospitals and so on.

And for good reason. Infrastructure is different to websites and software. People need infrastructure; it is always in demand. Transport links, terminals and utilities generate stable, predictable, long-term cash flow, uninterrupted by vagaries of fashion or the ups and downs of the economic cycle.

In 2007, record sums of equity were raised for private investment in infrastructure. In September 2008, a rare ‘trophy asset’ came on the market when BAA announced that Gatwick Airport would be sold for an expected price of £1.8bn. But within weeks financial institutions worldwide were rushing for the life-jackets. Since then, credit insurance has disappeared and bank lending – which constitutes the bulk of the finance for infrastructure investment deals – has all but frozen.

The question many investors and owners of infrastructure assets are asking is, will the credit crunch stop this wave of investment in its tracks? Or can new sources and methods of finance keep it on the rails?

To find the answers, we met Hamish Mackenzie, a Managing Director and Head of Acquisitions at RREEF Infrastructure, part of Deutsche Bank’s alternative investments business. RREEF manages major stakes in a large number of infrastructure investments worldwide including Melbourne Airport,



Peel Ports in the UK, the German motorway service operator Tank & Rast, and the A5 Ostregion toll road in Austria. Together with Steven Lloyd, leader of Arup’s transaction advice team, which has carried out technical due diligence and deal advisory for infrastructure funds on assets around the world, Mackenzie mapped out the prospects for the next few months.

Despite the UK Government’s desire to build the country’s way out of recession with investment in new infrastructure projects, some observers have predicted the collapse of the PFI and PPP forms of procurement in the wake of the lending crisis. “As we entered the credit crisis, project finance seemed to be the most resilient form of financing,” says Mackenzie. “As the crisis has progressed, the pricing of PFI deals has moved from the 50-60 basis point margin (i.e. 0.5-0.6%) up toward the 100 basis point margin (1%). And now, where deals are being done, it’s closer to 200-250 basis points (2-2.5%), which makes deals a lot more expensive, putting pressure on equity returns and prices.”

“Current deals are being done – just,” says Lloyd. “But there is more uncertainty on the future deals front. The market that underpinned traditional PFI doesn’t exist any more, and it’s extremely difficult

and expensive to get the kind of 30-year, highly-leveraged finance structure that underpinned PFI in the past. The authorities that have procured those PFIs are going to have to do something different, such as taking a different risk allocation over a shorter tenure of 15 years, perhaps.”

So, with credit more expensive and in short supply, how are new deals to be financed? With a greater share of equity, says Mackenzie. “Previously on an infrastructure acquisition, you would have two-thirds to three-quarters of the enterprise value financed by debt. Now we’re seeing closer to 50% from banks.” “If the debt isn’t there to support valuations,” adds Lloyd, “asset vendors must bring their price expectations down.”

Exceptional, high-profile assets such as Gatwick will continue to attract interest from banks. Other than that, investors will have to settle for much more modest deals. “Previously, you could do a £5bn or £6bn, even a £12bn transaction,” says Mackenzie. “Now the maximum deal size is closer to £1bn, because banks aren’t underwriting. So you need to work with a club of banks and there are limits to the manageable size of a club.”





- 1 Gatwick Airport Bridge, UK.
- 2 M6 Toll Road (Birmingham Northern Relief Road), UK.
- 3 Steven Lloyd, leader of Arup's transaction advice team.
- 4 Hamish Mackenzie and Steven Lloyd.
- 5 A650 Bingley Relief Road, UK.
- 6 Wind Farm.
- 7 Hamish Mackenzie, a Managing Director at RREEF Infrastructure.



The added caution with which investors must now proceed has placed an extra onus on due diligence, and on fully understanding the business case of assets before acquisition. The kind of guidance on deals that Arup's transaction advice team provides, combining technical and commercial expertise, is increasingly being sought by funds. "From an investment perspective," says Mackenzie, "we have to focus a lot more on how we create value. RREEF is an asset manager, not an operator. We tend to invest in businesses that have a strong management team, or invest alongside a new management team or an industrial partner. One way in which we are different to other infrastructure investors is our ability to work collaboratively on complex deals in partnership with other investors and technical advisors such as Arup."

Government has a role to play in stimulating the investment market, too, through subsidies, credit support (as was the case on High Speed 1, the Channel Tunnel Rail Link) or other means, if it is to develop the infrastructure it needs. "But from my perspective", continues Mackenzie, "a more important role is structuring infrastructure investment opportunities so that they are attractive to the private sector, so that there's a chance for us to generate adequate

returns. This will free up capital to flow into developing and owning infrastructure that is currently either owned or developed by the public sector."

"The underlying need for infrastructure is still as strong as ever," says Lloyd. "There is aged infrastructure that needs replacing, and the need to invest in schools and hospitals, as well as the expansion of integrated transport systems. That infrastructure has got to be built, so the capital has to be released, somehow." Arup's own Heathrow Hub proposal (see page 6), which would revolutionise access to the airport with new high speed rail links to Europe and the rest of the UK, is one major future project that could be financed privately.

The perennial need for more or 'better' infrastructure will keep generating new opportunities for future investment. A good example is power generation. "The UK is way off meeting its renewables targets. To get anywhere near its target, there has to be more investment in offshore wind. The industry is still in its infancy in the UK. So there are big opportunities there."

Other 'hotspots' are likely to emerge in Spain, where restructuring is leading to the disposal of assets by utilities and large construction companies, and in

**"The UK is way off meeting its renewables targets. To get anywhere near its target, there has to be more investment in offshore wind. The industry is still in its infancy in the UK. So there are big opportunities there."**

the 'unbundling' of energy transmission networks from supply activities across Europe. Central and Eastern Europe also hold promise.

"What the credit crunch hasn't done is undermine the quality of infrastructure assets," says Lloyd. "They are still solid assets for generating cash over the long term."

"If infrastructure can weather the downturn," adds Mackenzie, "then it really supports the investment case that infrastructure is different and really warrants its own asset class."

# OPEN FOR BUSINESS



**Paul Griffiths, Chief Executive of Dubai Airports, talks to A<sup>2</sup> about opening the world's largest airport terminal, his vision for the development of aviation in Dubai and the future of the industry.**

In a transition process managed by Arup, Emirates Airline moved smoothly into its new home at Dubai International's Terminal 3 (T3) during November 2008. At nearly 1km long, the new concourse at T3 is the world's largest single terminal building. Five of its 26 gates can accommodate the enormous A380 aircraft and, with over 63km of conveyors, the baggage system is one of the longest in the world.

You might expect a few teething problems on the opening day of such an ambitious project. But, under the gaze of the world's media, things ran smoothly. "Everything went so well that it looked as though the terminal had been running smoothly for some time," says Griffiths. "All of the systems operated as expected and the baggage from the first aircraft to arrive at the terminal was on the carousel within 14 minutes."

Arup's operational readiness activation transition (ORAT) team worked for two and a half years on the project – taking the new terminal from a static state of construction to a live working terminal. The ORAT programme gave the airline and airport stakeholders the chance to train their staff in an operational environment before the first passengers arrived. It also helped to identify opportunities to make improvements before the terminal's opening day. Central to the success of the ORAT programme was the largest ever airport trials programme. Comprising more than 60 trials over six months, some involved over 4,000 public volunteers and 13,000 bags.

This attention to detail was vital, says Griffiths. "Operational readiness was the biggest single objective that could have defined success or failure, as the impact of reputational damage resulting from poor airport openings can be immense."





© Dubai Airports

“The success of T3 stems from the fact that we treated it as a complex integration project requiring very close cooperation between all the stakeholders, rather than just an architectural design challenge. We made opening the terminal dependent on building condition rather than aiming for a specific date.”

Griffiths believes that the lessons of operational readiness are applicable to other businesses too. “I recently went to a large shopping mall that had just opened in Dubai and was quite shocked at its state of readiness,” he says. “If they’d have had the same process the area would have been in much better shape.”

As well as preparing for the opening of the terminal, Griffiths has been working with Arup to prepare his organisation for its role at the heart of Dubai’s future through a programme of organisational restructuring and change management. “We’re focusing a huge amount on the development and

**“Operational readiness was the biggest single objective that could have defined success or failure.”**

existing employees to help them upgrade their skills. My aim is to make sure that every promotion and senior appointment that we make in the future will come from an internal source – hopefully an Emirati source.”

Griffiths has a clear vision for what he wants this home-grown organisation to achieve. “One of my key strategic objectives is to make absolutely sure that we are

learning skills of our employees. Arup has been very helpful with this.”  
 “We’ve been able to define exactly which skills are missing and recruit staff to work cooperatively with

building and developing facilities, processes and standards of service that will enable us to cope with the anticipated levels of growth while providing a consistent level of quality. When the new airport – Al Maktoum International opens towards the end of the next decade, Dubai expects its passenger throughput to be around 160 million each year at capacity.”

Griffiths explains how a defined national plan gives the airport this strategic direction. “The service experience that people will get to know and judge will probably be more focused in Dubai than anywhere else in the world. The Dubai Strategic Plan, which is the vision of His Highness Sheikh Mohammed Bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE, and Ruler of Dubai, extends to 2015 and describes the Dubai of the future. This makes it very easy to align your own corporate objectives with the national plan.”

Dubai’s location is also a key driver for the airport. “Dubai is the natural geocentric hub for air travel,” says Griffiths. “There are hardly any two cities worldwide that are not logically connectable through Dubai. And when you’ve got that degree of logistical focus you can actually build a very successful and significant hub through which you can channel large volumes of traffic.”

Griffiths believes that providing passengers with a safe, secure and exciting experience that makes them want to travel through an airport again is vital. “Security and safety is absolutely paramount in an airport. We’ve got to have the latest techniques, processes and procedures. But at the same time, you’ve got to make them so discreet that they don’t get in the way of the passenger experience, because

**“Customer service is the new competitive battleground.”**

customer service is the new competitive battleground.”  
 Aside from maintaining this focus on customer service, what else will see businesses in aviation and other sectors through harsher economic times? “Revenue optimisation, focusing on their core offering, and maximising efficiency – those are the three things businesses need to concentrate on to come out in good shape,” says Griffiths. “Companies can take the opportunity to address things that in good times they wouldn’t have chance to tackle.”

“Human ingenuity will always find solutions to the challenges we face. I think the doom and gloom that’s around at the moment is not based on a sustained realistic view of life. I’m an optimist. There will be another side to the current turbulent climate, we just don’t yet know when.”

Whatever the outcome of the current economic difficulties, Griffiths believes that sustainability will play an important part in the future of aviation. “It’s absolutely clear that a solution needs to be found to make aviation a much more sustainable activity,” he says. “Capacity is clearly going to be an issue too. It’s not just about capacity on the ground. There are going to be some significant challenges in the future in terms of how we are going to accommodate the amount of predicted traffic within controlled airspace.”

**Above:**  
T3 Kerbside at night.



**Paul Lewis**, Operations Director of Stanhope, thinks so. He talks to A<sup>2</sup> about how Stanhope is addressing the current market challenges, and the opportunities for **property developers** to embrace innovation and emerge from the recession more focused and responsive.

# IS THERE AN UPSIDE TO THE DOWNTURN?



- 1 Chiswick Park, UK.
- 2 Broadgate, UK.
- 3 BSKyB, UK.

With the property market experiencing its toughest time for decades you might expect to find a director of one of the UK's foremost developers and development managers in a pessimistic mood. However, Paul Lewis believes that the downturn could bring opportunities for the industry – whether through innovative design and construction techniques or smarter use of existing buildings.

“At times like this it seems that moving forward with projects is impossible, that they can't work,” he says. “But in the past, conditions like these have produced some outstanding projects which set new benchmarks on the back of smart research and innovation. Now we need to do the same to find new ways of kick-starting the market.”

Lewis says Stanhope is well-placed to ride out the current financial storm. The firm works with secure clients like BSKyB, Rothschilds, The Crown Estate, Schrodgers and Legal and General. Well-known for its city centre office developments, it is also targeting new markets such as residential and retail-led mixed-use developments, and looking outside of its traditional central London focus. The Bracknell masterplan and Hereford Retail Quarter are amongst Stanhope's current developments.





“We haven’t changed the emphasis from our core areas of the business,” says Lewis. “There’s no need to do that. The key to safeguarding and enhancing the future of our business is to make sure that as markets shift, we can move to where new opportunities arise.”

Lewis also highlights the opportunities offered by helping companies and banks looking to offload some of their property into the market. “Rather than sell straight away, we could help them take a longer-term view,” he explains, “enhancing the value of that asset in order to release it at a time when they could do much better from the transaction.”

With the Government looking to invest in infrastructure and education developments as part of its fiscal stimulus, companies like Stanhope can take advantage of opportunities, albeit ones outside of their traditional market. But what of the risks that this diversification might pose?

“Provided you attack these new areas of business with the same rigour you would for a market you’re comfortable in, you can do some wonderful things,” says Lewis. “We worked on projects like Glyndebourne Opera House, Tate Modern and the Royal Opera House coming out of the last recession in the mid-1990s.”

“In the past, conditions like these have produced some outstanding projects which set new benchmarks on the back of smart research and innovation.”

These lessons from previous recessions are standing Stanhope in good stead. Many of its relationships with contractors and consultants have endured downturns before and emerged stronger. To help weather the current storm, the company is continuing to invest in external and internal relationships.

“We’ve got a large delivery team whose varied expertise we’ve been able to hold on to,” says Lewis. “People tend to stay at Stanhope for a long time. We also work with the best, and our relationships with consultants like Arup and with trade contractors mean that we’re constantly in touch with those parts of the market. We leverage their expertise, challenging them to do better and usually we get a great result.”

For Stanhope, the downturn is also an opportunity for research and innovation to help reduce construction costs and increase the speed of development, without stripping away value or quality. “When everyone’s extremely busy, innovation tends to take a back seat. As a result, prices have crept up over the past decade. Now we’ve got to get



back to the sort of focused research and innovation that led to groundbreaking schemes like Broadgate and Chiswick Park and set new standards in construction. That’s the sort of work that will help pull us out of this recession.”

One example of this innovation is Stanhope’s collaboration with Arup on new building solutions incorporating Intelligent Engineering’s SPS (Sandwich Plate System) technology. This prefabricated lightweight composite plate component promises to reduce construction time by up to 35%.

Arup’s advanced technology and research team (AT+R) specialises in turning innovative ideas and new products into cost-effective performance-assured engineering solutions for companies like Stanhope. Another recent example is the development of revolutionary damping systems for the structures of high rise buildings, whereby they can reduce structural costs by up to 15% and increase floor area by 1-2%.

“Going back into buildings to measure their performance is also extremely important,” says Lewis. “It’s all very well designing them to have low running costs but design teams and developers should be going back into buildings to see how they are performing.” To this end, Stanhope makes use of post-occupancy studies as



“Buildings have to be aesthetically pleasing, flexible, and cost effective to build and operate.”



advocated by Arup expert Adrian Leaman (see page 17) to feed back knowledge about completed projects and continually improve its developments. As well as energy use, the studies consider factors such as thermal comfort, lighting, noise, and people’s perception of health and safety – everything that contributes to making a building usable.

As many businesses put new-build projects on hold, their focus is turning to getting maximum value from their existing stock – from maximising operating efficiencies and sustainability, to looking at how design can improve human performance (see page 7 for more information).

Arup recently launched its Existing Buildings Survival Strategies to help clients re-energise tired assets and reduce operating costs (see page 5 for more information). The launch took place at Unilever House in London, an award-winning project that exemplifies the benefits of this approach.

on that. By refurbishing their existing building they’ve been able to maintain this heritage and create a striking and productive place to work.”

Arup’s SPeAR design tool helped to manage the sustainability of the Unilever House project – something Lewis believes will be key to creating developments that will kick-start the market. “Buildings have to be aesthetically pleasing, flexible, and cost effective to build and operate,” he says. “Sustainability – particularly energy efficiency – is an essential part of this and people who don’t take it seriously will get left behind, it’s as simple as that.” Arup has recently examined the actual thermal and energy performance of Building One at Stanhope’s Chiswick Park development in London to help refine the design of future buildings on this major business park.

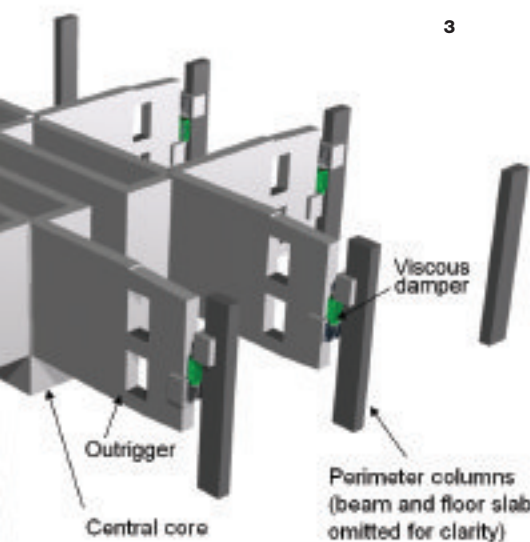
“There’s no doubt that we’re in for an extremely tough time – at least one and maybe two years of difficulty,” Lewis concludes. “Market conditions are different from the last recession and overall recovery could take a long time but I think that once the upturn comes it may come swiftly.”

“Developers need to get themselves into a position where they can satisfy the demand that will arise. But they also need to bring significant efficiencies back into the industry, remove waste and reduce costs while enhancing value. That’s what we’ll be focusing on at Stanhope in the next few years.”

“As many businesses put new-build projects on hold, their focus is turning to getting maximum value from their existing stock.”

After asking Stanhope to look at different options, from light touch refurbishment to constructing a new headquarters, Unilever chose a major refurbishment of their existing building. The redevelopment retained and refurbished the building’s original 1930s facade with its distinctive columns – as well as 60% of the existing structure – whilst the back of the building was completely redesigned and rebuilt.

“Choosing a major refurbishment was a brave decision,” says Lewis. “But Unilever had over 70 years of heritage invested in that building. It’s impossible to put a price



1-2 Unilever House redevelopment, UK.  
3 Example of Arup high-rise damping system.



# LEARNING LESSONS FROM BUILDINGS

*Adrian Leaman profiled for A<sup>2</sup>*



**Name:**

Adrian Leaman.

**Position:**

Usable buildings specialist.

**Most innovative work:**

Probe – a seven-year research project to study the energy use and occupancy of twenty buildings. The project pioneered an efficient and practical way of examining buildings in use and the approach has been adopted by Arup.

**Biggest challenge:**

Overcoming industry resistance to post-occupancy studies.

**Future aspirations:**

For every building to undergo post-occupancy study so that lessons can be learnt for the next one – embedding the findings into new professional processes.

Adrian Leaman works with developers, universities, local authorities and corporations to help them understand how people use their buildings. Based in Arup's advanced technology and research team, he studies buildings from the occupants' point of view and feeds his findings into future building designs – helping clients to create more usable buildings.

Leaman joined Arup in 2008 having pioneered post-occupancy study through his Building Use Studies (BUS) and the Usable Buildings Trust, where he continues to work. He has used data from BUS to create benchmarks for building usability in the UK, Ireland, Australia, New Zealand and Canada – as well as an international green building benchmark. He was also instrumental in Probe, a seven-year research project to study the energy use and occupancy of twenty buildings.

What makes a successful building? Leaman cautions against focusing solely on workplace productivity. "People become obsessed with the productivity score at the expense of other considerations – thermal comfort, lighting, noise, people's perception of health and safety in the building, whether their needs are met, whether they like the aesthetics, their perception of control and their journey to work. All of these factors contribute to a successful building."

Leaman's research has revealed that few buildings score highly across all these

usability factors. But one that does is Rivergreen Business Centre in Durham. In 2007, Arup carried out an occupant satisfaction survey on the centre using Leaman's BUS methodology. It revealed the building to be the best building of its type in the UK – ranking in the top 17% of the BUS dataset.

Naturally ventilated, the centre beats best practice energy targets and houses happy and productive occupants by making use of simple features like windows that occupants can open to control their environment. "Rivergreen is a perfect example of the value of post-occupancy studies," says Leaman. "The developer is now going away to build his next generation of buildings with the feedback from this one."

Using people's day-to-day experience of a building to inform future designs may seem like an obvious idea, but it's one that Leaman has struggled to get accepted within the construction industry. "It's taken 20 years for the term 'post-occupancy evaluation' to become widely known in design practices," he explains. "Arup has been using the Probe approach to inform its building design for 15 years, but a lot of people are scared of feedback."

However, times are changing and Leaman finds that the benefits of post-occupancy evaluation are being recognised because of green buildings like Rivergreen. "You can't pretend to be sustainable without monitoring what you've done – looking at actual performance rather than modelled performance."

Does this green focus mean that buildings are getting better? Leaman addressed this question at Arup's recent Design for Human Performance conference (see page 7). Although his research has revealed that not all green buildings are as sustainable as they set out to be, it has also shown that buildings are getting better.

"Comparisons from occupant surveys of UK buildings in the 1990s and 2000s show that, from the occupants' point of view at least, buildings are getting better," he says. "They are more comfortable, especially for ventilation, lighting and noise; less so for thermal comfort."

Leaman's goal is now to help improve buildings further, by making post-occupancy studies routine on all Arup projects worldwide – and to get this approach adopted throughout the industry.

# HOW TO SURVIVE AND THRIVE: A HOLISTIC APPROACH TO IMPROVING PRODUCTIVITY

**Neil Ridley, leader of Arup's operations consulting practice, discusses how companies taking a holistic approach to people, process and technology can improve productivity to survive the recession and emerge in competitive shape.**

Improving productivity reduces costs, increases revenue and market share, and improves service. In the benign, prosperous economic climate of the past 10 years, organisations have had time to develop and test improvements without impacting their core business. However, the swift onset of the recession has challenged all businesses to further improve productivity quickly whilst operating in an unfamiliar and rapidly changing financial environment.

What should organisations invest in to increase productivity? *Getting More From the Same*, the Management Consultancies Association (MCA) report published in November 2008, researched which levers will have the greatest impact on productivity improvement. Respondents, including over 80 CEOs, CFOs and COOs, identified the top three as behavioural change, process improvement and technology.

At Arup, these three levers are central to our culture.

Taking a holistic view that includes people, process and technology ensures the optimal interplay between them – delivering benefits to us and our clients.

Two areas that are particularly worthy of consideration in these tough economic times – and which I will outline here – are knowledge management and workplace design.

## **Knowledge management**

Managing knowledge within organisations has become increasingly difficult in recent years. Decisions must now be made faster, against more aggressive global competitors, and in the face of more information than ever before. With most companies under pressure to reduce staff numbers, it is important to ensure that the firm does not lose valuable knowledge and competitive advantage.

In the current climate, knowledge management (KM) is vital. KM integrates expertise in people, process and technology to create business benefit – applying skills drawn from areas as diverse as business strategy, IT, information science and organisational effectiveness.

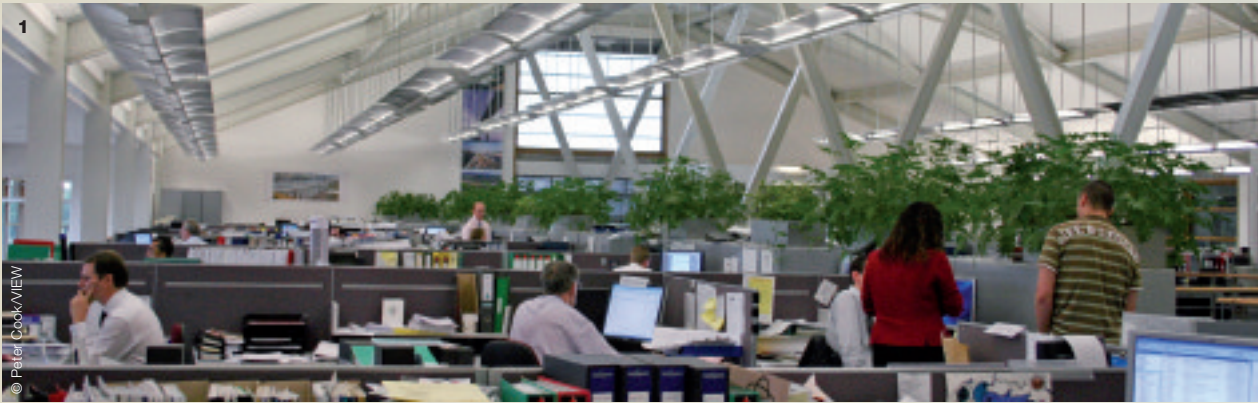
**“Taking a holistic view that includes people, process and technology ensures the optimal interplay between them.”**

As a result, successful KM is difficult to achieve. Many organisations have struggled to choose appropriate KM tactics amidst a maze of potential solutions. In practice, the choice is relatively straightforward: firms seeking to innovate will focus more on KM techniques that support creativity by creating strong networks between people, whilst firms seeking to deliver standardised products will tend to focus more on systems and processes.

The value of KM is undoubted. Working with clients to develop strategies and business cases for knowledge management, we see returns on investment of 250%







1 Arup Campus, Blythe Valley, West Midlands, UK.

over a five-year period. A recognised leader in the field, Arup has won a number of international awards for its KM and realised the benefits across its own organisation:

- Reducing the time it takes to find knowledge, increasing efficiency
- Improving the speed at which we can deliver, maximising value to clients
- Increasing productivity, staff retention and thus knowledge retention.

Successful organisations of the future will make knowledge work for their clients better than ever before. Clients come to businesses demanding access to the best possible experience rather than merely the best available. They will expect people to deliver current good practice, supplementing this with an ethos of improvement and innovation.

These client expectations will continue to rise, and organisations that fail to match these standards will not survive. To thrive in the future, organisations must manage knowledge strategically, developing an ability to recognise and exploit new market needs. The key challenge will be responsiveness, and the ability to combine existing skills and interests from unexpected sources in ways that create client value.

### Workplace design

A second example of where people, process and technology can be combined to provide significant productivity improvements is workplace design.

A growing body of research, such as the post-occupancy studies conducted by Adrian Leaman (see page 17), is helping to address the historical lack of baseline data that has made it difficult to put an exact figure on the benefit of a holistic approach to workplace design. Indeed, it has been estimated<sup>1</sup> that poor working environments could be costing British business more than £135bn every year.

With the recession driving businesses to make more use of space, workplaces are being redesigned to cut costs – with firms

often reducing floor space or moving to lower cost locations. However, increasing staff density beyond the optimum will cause productivity to deteriorate. Similarly, moving to a lower cost location with the same floor space but a different layout will affect productivity.

Having an intimate understanding of everything about an organisation – from its mission and structure to customer and stakeholder relationships – can give vital insight into performance-enhancing design. Despite this, ensuring that an organisation's facilities reflect its persona and culture is still very much an afterthought for many.

The important factor is to understand why changes happen and how to manage them – something that again requires an integrated approach to people, process and technology. An effective workplace needs to take account of the work that is performed there – whether it is more process-based, such as warehousing, or knowledge-based, such as media. To make the greatest contribution to business success, a workplace must consider:

- Physical factors, such as ergonomics and health
- Cognitive requirements, including system-human interactions and ease of use
- Organisational issues, such as vision and values, culture and business performance.

At Arup we use a range of methodologies to engage architects and engineers in design work that adopts a user-centred approach. Gaining a comprehensive understanding of people's interactions within daily operations and analysing working styles can really help to define and achieve the desired organisational vision.

This delivers designs that use the most appropriate technology, processes that enable these designs to be fully exploited, and socio-technological approaches that combine people, process and technology for maximum return on investment. This three-pronged approach unites the design

**“Poor working environments could be costing British business more than £135bn every year.”**

team and is applicable to any project – from a hospital ward to a building, train station, or office.

At King's Cross Underground Station in London, Arup used human factors studies to design the new ticket office and operations room around the people that use them. Here, as on other projects, Arup has achieved a final design output that is closely aligned with organisational aims, objectives and working practices.

### Building on existing foundations

Neither workplace design nor knowledge management require organisations to start again. Many businesses already know they need to address these issues. At Arup, we're helping clients to build on what they already have available and to improve upon it by considering the complete system in which it operates.

In these difficult times it is tempting for organisations to take quick decisions without fully understanding the unintentional consequences and the medium-term impact. Those that thrive as economic growth returns will be those which take short-term decisions while understanding what the medium-term implications would be.

To achieve this successfully, businesses need to think holistically. The greatest productivity gains will come from reviewing existing strategies and improving how people, process and technology function together.

<sup>1</sup> Gensler (2005). These Four Walls. The Real British Office. Gensler, London.





Can technology transform the way we live to make cities smart and sustainable? **Wim Elfrink**, Cisco's Chief Globalisation Officer, talks to A<sup>2</sup>.

# RUNNING ON INFORMATION

With half of the world's population now living in cities, the capacity of urban areas is pushed to its limits. Yet our cities have a vital role to play in creating a sustainable future, with urban centres currently accounting for around 80% of the world's greenhouse gas emissions. Cisco believes that innovative urban planning, networked technologies and smart policy for sustainable cities will be central to delivering the successful cities of the future.

To this end, Cisco launched Intelligent Urbanisation in February 2009 – an initiative to help cities harness technology to cultivate sustainable, intelligent industries, improve public services and foster economic growth. Initially, Intelligent Urbanisation will focus on four areas: intelligent and sustainable safety and security, transportation, buildings and energy.

"This is a \$10bn market but needs a holistic approach" explains Elfrink. "Through our research, we came to the conclusion that there is a good case for Intelligent Urbanisation; the benefits range from providing public services, such as transport, health and education, to attracting business and improving the quality of life of citizens. And then, of course, there's sustainability. By using smart technology, you can empower people to make sustainable choices, and easily increase energy efficiency in a city by 30-40% within 20 years."

It's a view that is shared by Arup. The firm sees information and communications technologies (ICT) as playing a key role in a broader strategy to help cities address the challenges of climate change and urbanisation. Through urban developments, such as Ebbsfleet in Kent and the Chinese eco-city projects, Arup has further developed its own concept of

**"By using smart technology, you can empower people to make sustainable choices, and easily increase energy efficiency in a city by 30-40% within 20 years."**

Urban Information Architecture – where information, communication and technology deliver services for the successful design, delivery and operation of cities.

"I couldn't agree more with the philosophy behind Arup's Urban

Information Architecture," says Elfrink. "At the moment, ICT is often an afterthought in development. But consumers are starting to demand it – from broadband internet access to smart metering. We need to consider factors such as mobility; most people realise that you can't simply build more roads to improve mobility in existing cities. We have to start thinking differently and information has a key role to play in this."

In his global Brunel Lecture tour for the Institution of Civil Engineers, Arup Director Peter Head argues that providing





information to people in a form that enables them to optimise their daily lives will help them to improve their quality of life and maintain a lower ecological footprint.

Elfrink explains: “We asked: what if a city could be run on information? How can we make information-gathering easier? And we came to the conclusion that we are tackling similar problems to those we were addressing 15 years ago when the internet was emerging. Back then the net suffered from having a variety of protocols and a lack of common standards that made it difficult to join everything up. Now we see the same things in areas such as real estate. Information is gathered, but there are 64 different protocols for temperature control, light control, elevators, security and energy management. This makes connecting everything up very difficult. We need to provide the IT services and platforms that will help to bring about the industrialisation of the internet – the city internet - to connect everything so that the information can be used to run cities effectively.”

Cisco has already initiated a thought leadership programme to develop these ideas through its five-year \$15m Connected Urban Development (CUD) programme. Born out of the company’s involvement in the Clinton Global Initiative, CUD is a partnership between Cisco and cities around the world to create communications infrastructures that demonstrate how network connectivity can reduce carbon emissions in urban environments. By using network connectivity for communication, collaboration, urban planning, and other activities, CUD will help change the way in which cities deliver services to residents, manage the flow of traffic, operate public transportation and use and manage their real estate resources.

As part of CUD, Arup is working with Cisco on a project in Birmingham, UK, around the potential for home energy monitoring devices to provide people with better information about their power consumption. The two firms are also

“We have to start thinking differently and information has a key role to play in this.”

working together on the Urban EcoMap Collaboration Platform for San Francisco. This will make data about greenhouse gas emissions

from transportation, recycling and energy available to urban communities in open source format via the internet. The EcoMap will drive awareness, foster a sense of community connection and responsibility and provide actions for citizens to take – helping to reduce greenhouse gas emissions as well as supporting decision-making for policy makers.

Elfrink believes that supporting city decision-makers will be vital if Intelligent Urbanisation is to succeed. “Until now the technology used for everything from road charging to energy metering has been proprietary. So there was no driver for the joined-up thinking needed for urban information architecture. Now we’re beginning to see providers getting together. But we still have to get chief information officers involved in city governance – to train urban planners in the use and application of technology in cities.”

Safety and security is a key factor that will make Intelligent Urbanisation an appealing concept for city leaders. “Mayors are aware that if they want to attract and retain businesses in their cities they have to work with holistic security scenarios,” says Elfrink. “If you want your city to host a conference, for example, you have to



demonstrate to organisers what your safety and security policies are.”

What will an intelligent city look like? “The best showcases I’ve seen so far are those like Singapore’s Intelligent Nation 2015 (iN2015) that have taken a holistic approach,” says Elfrink. iN2015 will bring fast 1GB broadband to homes and put common wireless infrastructure in place across Singapore, giving the city seamless access to intelligent technology.

Within its own business, Cisco is leading the way. It has already deployed 410 telepresence systems – the next generation of video-conferencing technology – across offices in 148 major cities in 42 countries. This has saved over 105,974 tonnes of CO<sub>2</sub> emissions by eliminating the need to travel for 49,062 meetings.

But what are the market opportunities for Intelligent Urbanisation? Creating this urban information architecture would certainly generate jobs. Crucially, Cisco has also found that consumers are demanding the kinds of services that Intelligent Urbanisation could enable.

“Services like this could also give developers a continued revenue stream after the end of a project – as well as other benefits of the smart use of ICT such as reduced building operating costs. And that’s the big question: who is going to monetise this? Will it be developers? Municipalities? It’s a new industry that needs new business models. Providing a platform for companies to develop applications in public safety, smart grids, and transportation certainly presents a unique opportunity.”

An example of the possibilities offered by Intelligent Urbanisation comes from Karnataka in India – the state that is home to Cisco’s Globalisation Centre East in Bangalore.

**“It’s not just the technology, it’s a combination of technology and governance that will help to deliver sustainable, intelligent cities.”**

“At Cisco we can monitor our power consumption online,” Elfrink explains. “So when the Indian state of Karnataka – which has undergone massive growth in recent years – asks us to reduce

our consumption to help them manage demand, we can do that online. We’ve now signed a memorandum of understanding with Karnataka to develop a network that will help avoid peak loads and enable officials to take informed decisions about how much power they need by running the state on information. Energy efficiency improvements like this offer tremendous return on investment for governments.”

Ultimately, it will be such close working with the public sector that delivers the future Cisco imagines. “It takes a holistic approach,” Elfrink concludes. “It’s not just the technology, it’s a combination of technology and governance that will help to deliver sustainable, intelligent cities. Companies like Arup and Cisco can lead the way but we’ll need to drive an entire industry and ecosystem, including academic programmes, technical certifications and global partnerships.”

This interview was conducted by Volker Buscher, Director in Arup’s IT and communications systems business. Volker and his team have developed the firm’s Urban Information Architecture services, and are currently working with Cisco to lead the way in harnessing the potential of ICT in cities.





# ENERGY STRATEGIES FOR A SUSTAINABLE LONDON

**Peter Bishop**, the London Development Agency's Director of Design, Development and Environment, talks to A<sup>2</sup>.



The Mayor of London's Climate Change Action Plan aims to reduce the city's CO<sub>2</sub> emissions by 60% by 2025 against 1990 levels. By then, London could have a vibrant green economy, generating 25% of its energy locally using combined heat and power, district heating, and advanced energy from waste technologies.

This vision is central to the London Development Agency's (LDA) energy strategy, itself part of a wider environmental brief that also considers waste, recycling, adapting existing buildings and greening the city. It's an integrated approach that promises to deliver improved environmental performance, create jobs and help attract inward investment for regeneration.

"We're particularly interested in how these environmental programmes can be driven by masterplanning and design," explains Bishop. "We wanted to understand how these initiatives fit together and make links that have the potential to combine regeneration with environmental savings. We will be working with organisations such as Transport for London and the Homes and Communities Agency. Energy strategy is a key part of our integrated approach."

The Design, Development and Environment directorate was formed following the LDA's reorganisation in the autumn of 2008. From the start, Bishop's vision was to use design and masterplanning to drive the city's spatial strategy – embedding environmental programmes at the heart of each and every development. As part of this, the London energy strategy is centred around three key elements: reducing demand, increasing

**"We're also developing an ambitious programme to retrofit residential properties."**

the security and efficiency of supply, and utilising renewable energy sources.

"Reducing demand is fundamental to the LDA's energy strategy," says Bishop. "Our Green500 scheme targets the 500 biggest organisations in London – those with the greatest carbon-saving potential. While the Better Buildings Partnership brings together the largest commercial and public property owners in London to improve the sustainability of the city's existing commercial building stock."

"We're also developing an ambitious programme to retrofit residential properties," he explains. "The scheme will be promoted in person door-to-door across London and will fund 10 actions that residents can take to save energy in their home – potentially saving people up to £200 per year on their utility bills."

As well as doorstep measures, the LDA is thinking on a grand scale. In east

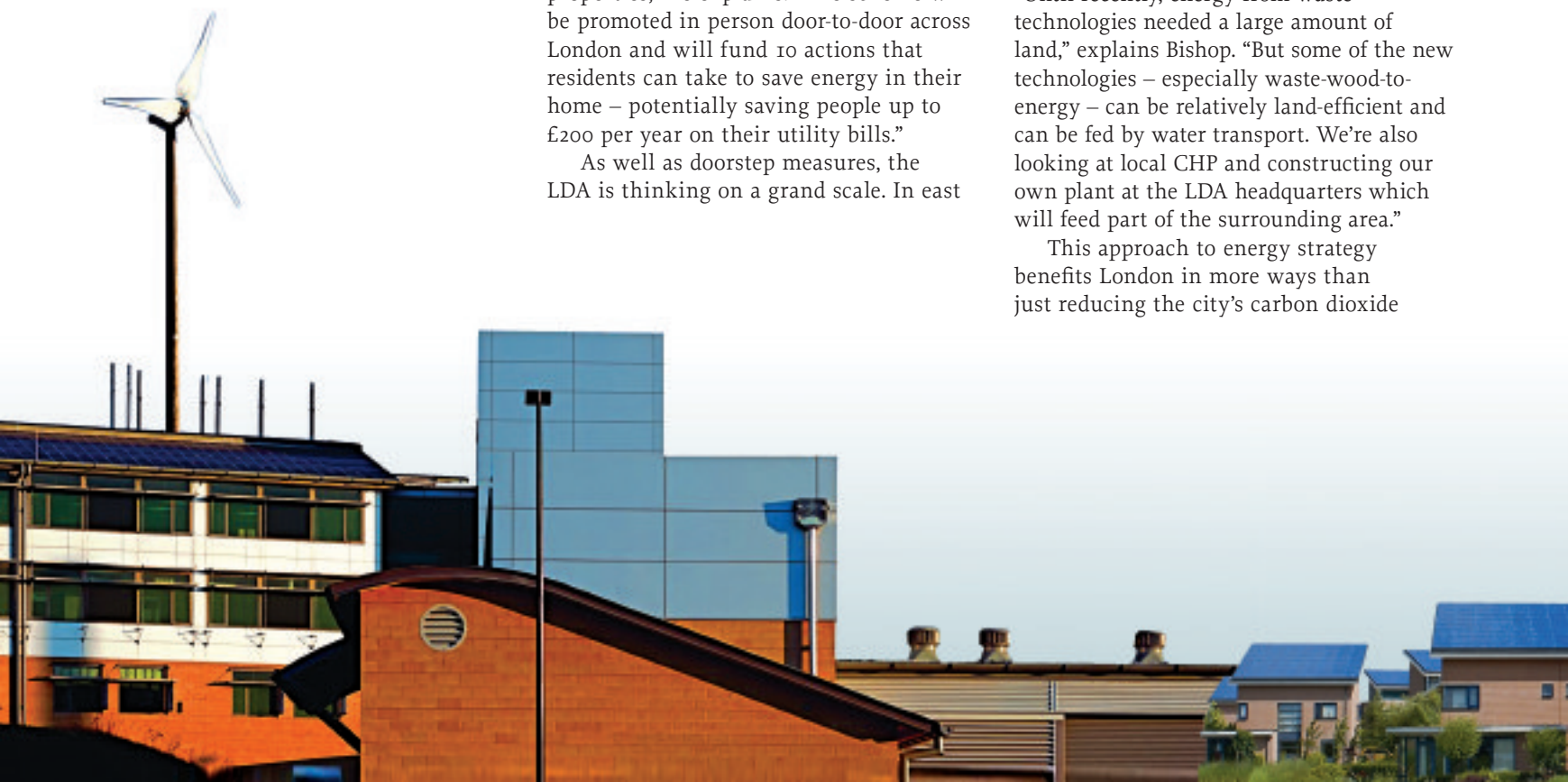
London, the Agency is working with Arup to carry out a study for a Green Enterprise District. This study will consider the value that a green economy could bring to London and how it may be supported. There will be clear spatial elements and some large parcels of land east of the River Lea which haven't been developed during the boom could be repackaged and developed around green technologies and emerging green industries.

Increasing the efficiency and security of the capital's energy supply is a second key component of the LDA's energy strategy. "Arup's energy strategy team has recently helped us to establish a decentralised energy programme across London," says Bishop. "This will help achieve the 60% CO<sub>2</sub> reduction targets set out in the Mayor's Climate Change Action Plan and establish a resilient energy supply that will be attractive to investors."

The largest project under development is the 23km London Thames Gateway Heat Network, which will connect 120,000 homes to diverse supplies of low carbon heat, including surplus heat from Barking Power Station. With the first customers expected to be supplied by 2011, the scheme could save almost 100,000 tonnes of CO<sub>2</sub> per annum.

The LDA is also investigating the potential to generate energy from waste. "Until recently, energy from waste technologies needed a large amount of land," explains Bishop. "But some of the new technologies – especially waste-wood-to-energy – can be relatively land-efficient and can be fed by water transport. We're also looking at local CHP and constructing our own plant at the LDA headquarters which will feed part of the surrounding area."

This approach to energy strategy benefits London in more ways than just reducing the city's carbon dioxide





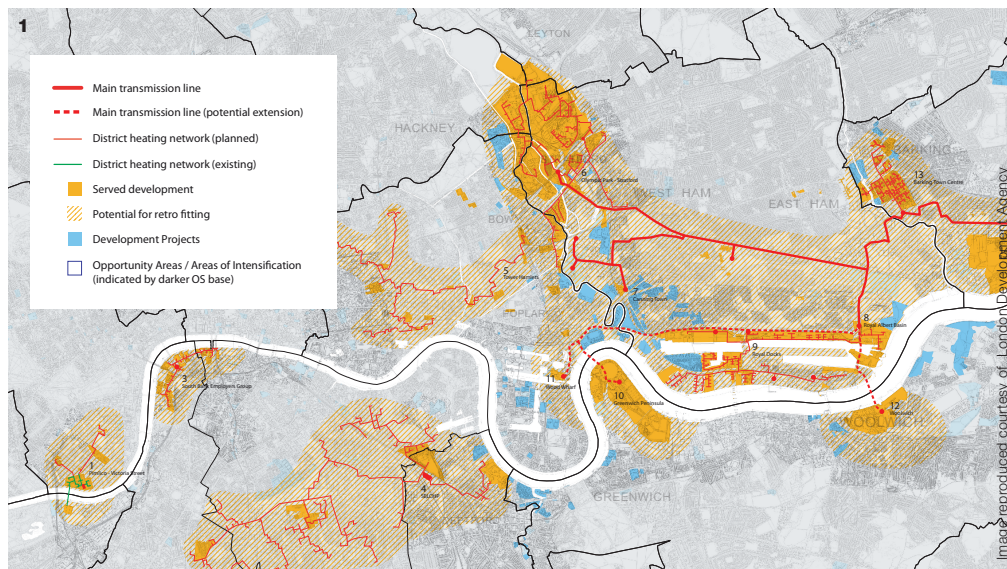
emissions. “The programme will offer training and deliver a huge number of jobs – getting people back into the labour market with a skill,” says Bishop. “We’re also developing programmes with the Thames Gateway Development Corporation to look at green jobs and whether we can put more money into existing training centres.”

As well as creating jobs, investing in resilient decentralised energy infrastructure will have additional benefits for London – not least attracting inward investment. “Being able to say that we’ve laid on resilient heat and power infrastructures is a major selling point – particularly for Asian and Middle Eastern investors,” acknowledges Bishop. “Fuel poverty is also an issue. If we can supply cheaper energy to homes and make those homes more efficient, we can divert money away from fuel bills and into improving quality of life.”

“Being able to say that we’ve laid on resilient heat and power infrastructures is a major selling point – particularly for Asian and Middle Eastern investors.”

Bringing business into this new greener London is another vital part of the LDA’s strategy, explains Bishop. “We’re looking at opportunities that green technologies give the London economy – not just from green manufacturing and clean technologies but also through carbon trading. It’s a huge opportunity that London is well-positioned to make the most of.”

By applying a range of urban development policies and investing in housing and infrastructure, Bishop



believes London can take an integrated approach to becoming a lower carbon city. Progress has already been rapid. “New policy has developed quickly,” he says. “Environmental programmes have gone from the fringe to the core of political agendas in the last two years. Two years ago there were huge barriers in terms of political awareness and readiness, public perception and institutional inertia. All of those have gone quite suddenly.”

Are there still barriers between London and a low carbon future? “There needs to be a serious debate about the true implications of going low carbon,” says Bishop. “We need to ask whether or not you can do that in an environment of perpetual economic growth.”

The economics of green technology could provide another stumbling block, warns Bishop. “The technologies are there in theory but not in practice. The market won’t adopt them without significant public pre-investment or subsidy.”

For example, you wouldn’t yet choose photovoltaic cells for your home as an economic prospect – unless you were interested in payback times of 20 to 90 years.”

Can this economic barrier be broken down? “I believe the situation will change rapidly,” says Bishop. “The technologies will become cheaper and eventually government will make them cheaper still by changing the tax regimes in which they operate.”

With rapid progress helping the LDA to overcome the hurdles that lie between it and a more sustainable city, Bishop is confident about the future. “What will London be like in 2025? I think the city will be better. The speed of progress in the last two to three years suggests that if we really apply technology to building and retrofitting for lower carbon we will live in a very different city. There won’t be a windmill on every building, but the city will certainly be greener.”



In a world where risks and unknowns seem to be multiplying by the week, **John Ludlow** of InterContinental Hotels Group talks to A<sup>2</sup> about how risk management is coming into its own – and doing its own bit for business in the process.



# TURNING RISKS INTO RETURNS

Risk managers have a lot on their minds at the moment. For example, the nature of last November's terror attacks in Mumbai, in which gunmen stormed hotels, bars and the city's main railway station, took areas of the international business community – and the rest of the world – completely by surprise. The threat of attacks on businesses and collateral damage from major incidents continues to loom in many parts of the world, while the interconnectedness of global communications brings a whole new set of risk factors.

Then there are the unpredictable and potentially devastating consequences on people and property of climate change and natural catastrophes such as hurricanes and earthquakes. And, of course, there is the increased threat of economic and political instability brought on by the global banking crisis.

A lot has changed since the 1970s, when risk management emerged as an explicit discipline, and a means for large, international corporations to control the impact on their organisations of risk and uncertainty. Today, as new risks emerge and corporations globalise and compete for stakes in the burgeoning economies of the developing world, risk management has assumed even greater importance. In fact, it is being seen less as a necessary but burdensome cost to business (along with insurance) and increasingly as a positive, enabling force that can reduce costs, safeguard share price, promote business continuity and generate new opportunities.

It is saying something to be able to turn the threat of catastrophe into a competitive advantage – particularly if you are a business with exposure to a very wide range of risks such as InterContinental Hotels Group (IHG), which owns, manages or franchises over 4,000 hotels under eight brands in almost 100 countries. By number of rooms, it is the world's largest hotel group. With 620,000 of them to fill every night, that's a lot of guests and staff to

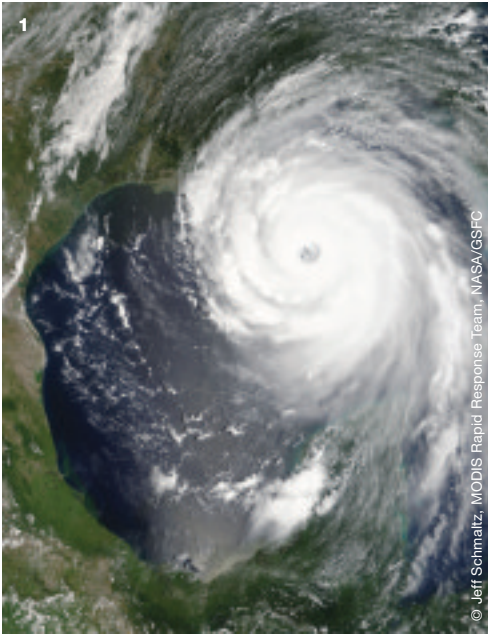
“Many people initially fail to see that risk management is a business enabler, because the upfront costs and effort can seem onerous while the benefits are long-term and may not always be seen.”

look after in a lot of varied locations, and a lot of risks to manage, from food safety to windstorm damage and terrorist attack.

IHG's Senior Vice President of Global Risk Management is John Ludlow. For him, making hotels safe and secure is more about brand management and delivering direct business value than fighting fires. “Many people initially fail to see that risk management is a business enabler, because the upfront costs and effort can seem onerous while the benefits are long-term and may not always be seen. Success in risk management often results in something not







‘The maximum probable loss at some individual sites and across the portfolio as a whole was found to be less than previously thought, allowing IHG to significantly – but safely – reduce its insurance bill.’

**1** Hurricane Katrina in the Gulf of Mexico, August 2005.

**2** The InterContinental Hotel in Seoul, South Korea. One of the 4,150 hotels owned, managed or franchised by the InterContinental Hotels Group.



answers gives us a point of differentiation in the marketplace and reinforces trust in the brand. The challenge almost goes back to them, to say, ‘Why are you letting your people stay in hotels that don’t have the sort of measures that we have?’”

Those measures range from high-level, strategic programmes, through robust engineering design of security infrastructure in the hotels, to operations-level systems and activities carried out by general managers and their teams.

At the strategic end, IHG recently rolled out a “threat-based, intelligence-led counter-terrorism programme” for its higher risk properties, aimed at gauging the threats to each hotel from terrorist and organised crime groups, identifying its vulnerability and weaknesses, and introducing measures – such as making the grounds and buildings more secure and resistant to attack – that will mitigate against future attacks.

It also commissioned Arup’s security and risk consulting group to assess in detail the risks that natural catastrophes such as earthquakes, windstorms and flooding, pose to IHG’s North American property portfolio. Assets in greatest danger were subject to site surveys, which yielded new measures to mitigate the risks at each site. The maximum probable loss at some individual sites and across the portfolio as a whole was found to be less than previously thought, allowing IHG to significantly – but safely – reduce its insurance bill.

Much risk management within IHG is not about these high-level strategic initiatives, though; it is about what happens on a day-to-day level within individual hotels, and making sure user-friendly checks, controls and systems are in place for general managers and their teams to follow. Ludlow lists the company intranet, an e-learning website, the Hotel Risk Management Action Plan template, and an electronic calendar populated with daily activities, checklists and resources as key tools that are accessible to managers in every hotel.

The standard tools and systems used across the group allow for local variations and innovations, encouraging a strong, cohesive team approach with knowledge and insights flowing up, down and around the risk management network. “We teach people to fish,” says Ludlow. “We give them a good rod and a net, and let them get on with it, and then come back and ensure they are catching fish!”

A little occasional “inspiration” comes in useful, too, says Ludlow, in encouraging people to become proactive in managing risks. “We have some amazing people who can deliver stories brilliantly of the kind of events and incidents that we have to deal with in our hotels. These anecdotes bring the issues to life for our General Managers, reinforcing the importance of risk management in their day-to-day activities. When you have 4,000 hotels and half-a-million room nights a night, you’re never short of stories to tell.”



## DELIVER US FROM EMAIL

*A simple solution to a common communications problem*

If you waste time rummaging through old emails, you're not alone. It's estimated that managers currently spend up to two hours every day searching for information. And if the information is required to support a legal proceeding, the consequences can be expensive – market intelligence puts the average cost of an e-disclosure event at \$1.5m. Mail Manager is Arup's simple solution to the challenge of filing and retrieving emails easily.

Developed by Oasys – the software house of Arup – in response to the firm's own needs, the Outlook plug-in has gone on to improve efficiency and cut costs for businesses around the world – from accountancy firms to local government. Its simple design makes Mail Manager easy to use and offers short payback times.

Looking for a solution to their email filing problems, Gensler chose Mail Manager.

"After assessing many products and engaging in an extensive trial involving 200 staff, Mail Manager stood out to us as the best tool on the market for our design teams to manage and archive their email", explains Ken Sanders, the company's CIO. "Email has become an essential form of business-to-business communication, and leaving emails that often contain critical project information in separate Outlook inboxes is equivalent to leaving letters piled up on desks."

How does it work? By enabling you to keep emails and attachments in the same folders as other documents, Mail Manager reduces the size of your inbox – cutting the need for expensive email server space. A high speed search tool lets you find what you want even when you're disconnected from the network, and a BlackBerry version due for release this summer will mean you can file messages directly from your handheld.

It sounds like a simple idea, but Oasys developed Mail Manager when Arup found there were no products available that solved its email filing problems simply. Other products lock emails on to external servers, taking data out of your hands, or use their own file formats rather than the standard '.msg', making the system vulnerable to future changes.

"Like many businesses, Arup did not want yet another system," explains Oasys Managing Director, Alec Milton. "New tools can quickly become legacy applications which are costly to maintain. So we decided to develop a tool that placed messages in normal file system folders using Microsoft's own file format. This meant that if the firm were to replace Mail Manager in future years, the messages can still be retrieved and read easily."

Importantly, Milton and his team realised that if the software didn't make people's lives easier,

staff would not use it. So from the outset human performance and efficiency were primary factors in the design. It was clear that people would not file messages if they had to open another application or if it meant one more job for them to do.

So the Oasys team built the application in Outlook, where the plug-in runs unobtrusively. Crucially, they also made filing part of the email process. Send an email from Outlook using the Mail Manager plug-in and you're asked where you want to file it. The system learns where you like to file messages and suggests those locations next time. As a result, filing is often reduced to one simple click – with no special training required to use the system.

Could cost savings be just a click away for your business? To find out, you can download a free 30-day trial of Mail Manager from [www.oasys-software.com/mailmanager](http://www.oasys-software.com/mailmanager).



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[www.oasys-software.com/mailmanager](http://www.oasys-software.com/mailmanager)



### Mail Manager

File, find and share

**Benefits:**

- Reduce Inbox size and email server space requirements
- Ensures emails are filed according to office standards
- Learns as you file
- One place to look - keep emails in same folders as other documents
- Easily adhere to data retention legislation
- High speed search tool, which allows you to search even when disconnected from the network - ideal for mobile workers
- No 'lock-in' - uses standard MS Office file formats
- Batch archive

Oasys

The software house of Arup

## TAKING THE LONG VIEW

*For sustainable facade materials, life-cycle thinking pays off*

Responding to the challenge of climate change will require building facades to deliver improvements in both their technical and environmental performance. By considering the impact of materials, such as glass, stone, metal, concrete and plastic throughout their life, facade designs can be produced that work effectively, cost less to construct and maintain, save energy and reduce CO<sub>2</sub> emissions in production, manufacture, in-use and at end-of-life. Arup is at the forefront of examining this ‘facade life-cycle payback’, offering an innovative approach through its unique combination of expertise in architecture, design, building physics and materials.

Launched in March this year, ‘Making the case for a Code for Sustainable Buildings’ is part of a schedule of initiatives that aim to deliver zero carbon commercial buildings by 2019. With prospective tenants already paying close attention to Energy Performance Certificates, the prospect of tighter future regulation is driving demand for buildings that exceed current standards in terms of sustainable design and operation. By providing building owners with more information about the environmental performance of facade materials and the system design over its lifetime, Arup helps them safeguard their investment in the long term.

“Building owners need to start asking more in-depth questions than how well a facade design scores on a particular rating system, such as Leadership in Energy and Environmental Design (LEED) or the BRE Environmental Assessment Method (BREEAM),” says Arup facade designer Graham Dodd. “Considering a facade’s overall environmental payback could



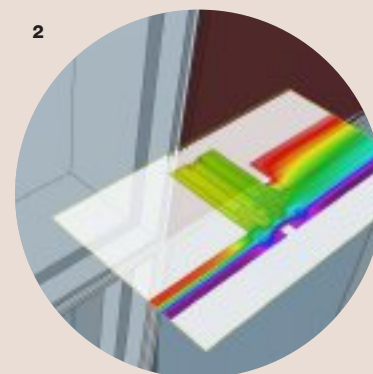
help them realise significant benefits – from a more desirable property portfolio to managing the risk of future liability to carbon taxes.”

What kinds of facade design and materials deliver good environmental payback? Dodd is quick to point out that the materials aren’t inherently sustainable; the key is how they are used. “A material’s environmental impact depends on what it will achieve over its lifetime, as well as how it is produced and what happens to it at the end of its life,” he explains. “Thanks to the contribution of our materials specialists, Arup Facade Engineering is able to take this innovative approach to design by considering questions as diverse as whether it can be sourced responsibly, how it will impact health and safety in the building and what its embodied impact characteristics are. This enables us to build up a complete picture of its environmental

sustainability. Addressing these issues alongside its operational performance represents a unique approach to facade design.”

Arup materials specialist Kristian Steele highlights an example: “A double-skinned facade is likely to be built up of an internal double-glazed curtain walling system, combined with an additional third skin of glass on the exterior. But all that material results in a great deal of embodied impact in production, and may only save you a few watts per square metre in service. It could take you a long time to pay back all the energy and ‘recover’ the associated embodied impacts which have gone into producing the facade.”

“On the other hand, a simpler high performance triple-glazing system in a single facade envelope quickly pays back the energy debt from its manufacture through lower heating or cooling costs,” says Dodd. “Because of the complex mixture of



**1** A facade will be environmentally sustainable when the optimum balance between its embodied and operational impacts has been achieved.

**2** Using building physics to assess operational performance is now combined with materials life-cycle assessment and embodied impact assessment to determine facade operational payback.

materials in a facade, optimising these components for energy performance, but at the same time balancing this with their embodied impact can have a big influence in terms of the design’s environmental – and economic – payback.”

Although considering life-cycle payback is an innovative approach to facade design, Arup has successfully used the concept before in highway design. Here engineers have looked at the impact of building new roads and bridges which will stimulate new traffic, against the environmental impact of traffic congestion arising from leaving infrastructure in its existing form.

Arup’s combination of life-cycle assessment skills and expertise in materials, facades design and building physics is enabling the firm to help building owners achieve this environmental payback for their buildings.





# NEXT ISSUE

## Future cities

We are keen to ensure that this publication is enjoyed by our readers and provides interesting, relevant and informative articles. All feedback is welcome, so please send your comments and

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Editors: Emma-Jane Foulkes, Emily Falconer.

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Designers: Tessa Smith, Jeremy Clark, Charlotte Svensson, Jon Carver.

Published by: Arup, 13 Fitzroy Street, London, W1T 4BQ.

Printed by: Beacon Press using *pureprint*, their environmental printing technique.

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