

# INSIGHT

The global infrastructure magazine / Issue No. 1 / November 2010

## Infrastructure 2050

Why the world must come together to solve the global infrastructure challenge

### Also in this issue:

- **Striving for Sustainability**  
A Q&A with Yvo de Boer, former Executive Secretary of the United Nations Framework Convention on Climate Change
- **China's Outbound Opportunity**  
Will China's infrastructure industry challenge the global status quo?
- **Demystifying Urban Transport Success**  
How the leading urban transport projects planned for success where others have failed



cutting through complexity™



# Foreword

We are delighted to present the first issue of Insight magazine.

Infrastructure is one of the great challenges of the 21st Century.

It is already a matter of life and death for the billions who do not enjoy clean freshwater, good healthcare, or access to reliable systems of energy and transport. For all of us, effective infrastructure is essential to the way we live and to supporting economic growth.

In recent years, infrastructure has become a critical issue for governments and businesses worldwide, as developed economies seek to address decades of under-investment, and as high growth economies establish their place in global markets.

Over the coming years, it will become an acute issue for all of us, as our collective mindset must change from one based on consumption, to one based on sustainability. Over the coming decades, we will invest in infrastructure on a scale that is unprecedented in history.

Decisions taken today are shaping the society of the future. At KPMG, we are privileged to be involved in many of the exciting changes that are happening in every corner of the world, across many sectors, and at various stages of the lifecycle of infrastructure.

This magazine seeks to share some of the insights we are gaining in the process. Infrastructure is complex, as well as critical, and the skills to deliver it are, for now, limited. It is essential, therefore, that we all seek to raise awareness and share knowledge of what we are observing globally.

We hope you find this an interesting read. On behalf of those who have contributed, we would welcome your comments and would be happy to discuss any of the issues raised in greater depth.

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## **Stephen Beatty**

Americas Head of Global Infrastructure  
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## **Julian Vella**

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## **2 Infrastructure Briefs**

### **4 Infrastructure 2050**

By Nick Chism

### **7 Regional Spotlight: Africa**

By Klaus Findt

### **8 Meeting the Challenge of Decarbonization**

By Dr Timothy Stone

### **9 Regional Spotlight: Asia Pacific**

By Graham Brooke

### **10 Striving for Sustainability**

Q&A with Yvo de Boer

### **12 Infrastructure in the Developing World: A Role for IFIs and Private Finance**

By Tim Stiles

### **15 Regional Spotlight: North America**

By Stephen Beatty

**Meeting the Challenge of Decarbonization**

p.8



**Advantage India: The Investment Imperative**

p.28

**The Role of International Financial Institutions in Infrastructure**

pp.12-14



**16 Going Nuclear: The Atom's Renaissance**

By Geno Armstrong

**17 Emerging Infrastructure Markets: Egypt**

By Darryl Murphy

**18 High Speed Rail: Going Places...Quickly**

By Daniel Loschacoff

**20 Demystifying Urban Transport Success**

By Richard Threlfall

**23 Emerging Infrastructure Markets: Indonesia**

By Graham Brooke

**24 Infrastructure Funds: Ready to Ride Again**

By Tony Rocker

**26 Regional Spotlight: Europe**

By Michele Connolly

**27 Priming the Pump: Solving the Water Challenge**

By Bastien Simeon

**28 Advantage India: The Investment Imperative**

By Manish Agarwal

**30 The Roll-Out of Next Generation Networks**

By Julian Vella

**32 Emerging Infrastructure Markets: Angola**

By Fernando Faria

**33 Roadwork Ahead: The Drive Towards Private Investment**

By Declan McManus

**34 Direct Investment: Tax Considerations**

By Naz Klendjian

**36 Regional Spotlight: Latin America**

By Tim Treharne

**37 Bridging the Divide: Project Finance and the Capital Markets**

By Darryl Murphy

**38 China's Outbound Opportunity**

By Andrew Weir

**40 Emerging Infrastructure Markets: Peru**

By Tim Treharne

**41 Delivering Social Infrastructure: Customizing for Success**

By Adrian Wimmers

**42 Power in the BRIC**

By Peter Kiss

**44 Thought Leadership Bookshelf**

# Infrastructure Briefs

## The global healthcare debate

Last year's debate in the US over healthcare clearly illustrates how close the sector is to the hearts of governments and populations around the world. But outside of the US, many other countries are also focused on delivering universal care through enhanced access to insurance. In Abu Dhabi, for example, all but the smallest employers have recently been required to provide comprehensive insurance for their employees and their families. This has created fresh demand on the system, which in turn has spawned a number of new healthcare infrastructure projects in the region, as well as a strong demand for clinicians and skilled managers.



London Metropolitan University Graduate Centre  
London, UK.

## School's out

To date, the UK had been a global leader in education Public Private Partnerships (PPP) with its Building Schools for the Future (BSF) program that was designed to invest more than £45 billion over 15 years. The program was unique in that it provided for the rebuilding of new infrastructure, the refurbishment of existing facilities, ongoing maintenance, inclusion of ICT kit and services, etc. It also layered on partnership requirements that encouraged community and economic regeneration as well as spin-off benefits that stretched far beyond the secondary-school age pupils' core education. However, with the election of a new Coalition Government, BSF has been largely halted. At the time of printing, industry participants were awaiting the new government's plans for allocating forward schools infrastructure investment which is expected by the end of 2010.



# Infrastructure 100

By Stephen Beatty

Thumbing through this magazine, one quickly becomes aware of the size and complexity of the global infrastructure challenge. But in the face of all this, we continue to experience an unprecedented level of investment and expansion in infrastructure around the world. In fact, in every region there are a number of infrastructure projects that are succeeding in rising above enormous and complex challenges to deliver a project that can only be described as inspirational.

London Array Offshore Wind  
Thames Estuary, UK.



That is why KPMG and the Infrastructure Journal teamed up to create the *Infrastructure 100*. We wanted to showcase one hundred examples of the great work that is underway in sectors and regions around the world. And while this was not an 'awards' publication, the list does include a number of projects that – in the view of our judges – distinguished themselves by their scale, complexity, innovation and impact on society.

This type of inspiration is critical to the public discourse on infrastructure. Too often, infrastructure comes across as forbidding and complex to the very people who use it every day. If the public is to truly become engaged in global consensus building – and no doubt they must – then we all need to do a better job at demystifying what we do and how we do it.

We hope that by creating the *Infrastructure 100*, we can take a first step in this process by bringing some of the world's most exciting infrastructure projects to the public that they serve. At the same time, each of these projects should stand as an inspiration to other infrastructure providers, governments and investors as to what is possible when we approach our infrastructure challenges with vision and ambition.

To read the full *Infrastructure 100* publication, visit:

[www.infrastructure100.com](http://www.infrastructure100.com)

# Infrastructure 2050

By Nick Chism

We are undoubtedly living through the most extraordinary period of change in human history. Yet, such is the pace of that change that we barely have time to think about it.



**9.2 billion**

The global population by 2050.

Consider that a person who celebrates their 100th birthday in 2050 will have seen the human population explode from 2.5 billion to 9.2 billion. That is growth equivalent to a city the size of London every month for a century. This will have been accompanied by an extraordinary rise in living standards. The global middle class will have expanded from 500 million people in 1950 to more than 5 billion by 2050. They will also have seen a dramatic rise in life expectancy. Most children born in

developed economies today will live to be 100 and some may live to 140.

Taken together, this unprecedented combination of changes – many more people, living far longer and enjoying much higher standards of living (albeit unevenly distributed) – will make the period 1950-2050 stand out as one of the greatest transformations in human history.

The coming decades present unprecedented challenges, as we strive to cope with these changes in a fair and sustainable manner, that creates a world fit for future generations.

Firstly, the challenge of urbanization. Our urban population will grow from 3.5 billion today to 6.5 billion by 2050. Such rapid growth brings great challenges, already evident in the transport and housing problems of a city like Sao Paulo. For the 70 percent of the global population that will be living in urban centers, some in cities of more than 100 million people, infrastructure will determine their quality of life.

The second great challenge relates to energy. As more people demand

greater levels of energy to fuel consumption, there are challenges of supply, sufficiency and sustainability. Infrastructure must support growth, but do so responsibly.

Third, is the vital challenge of freshwater. Already, 20 percent of us lack clean drinking water and 40 percent lack basic sanitation. As this global divide becomes even more acute, it will drive radical changes in awareness and behaviors around water usage and management, and the energy intensity of our consumption. Infrastructure is vital in addressing this challenge.

The fourth great challenge relates to social infrastructure and the question of how we – collectively and as individuals – will finance the cost of more people, living longer, and having fewer children. Long-term decisions on infrastructure need to take account of the social implications of these changes.

KPMG and the Economist Intelligence Unit surveyed hundreds of global business leaders in 2010 and found that 90 percent regarded infrastructure as a critical issue.<sup>1</sup> Why has it become so acutely critical recently?

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## Governments and businesses must make vital strategic decisions now, and promote changes in behaviors and long-term thinking.

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Firstly, it has been neglected for too long. Tragedies in New Orleans and Minneapolis have highlighted the obsolescence of much US transport, water and social infrastructure. In India, lack of infrastructure is the primary constraint on economic growth.

Secondly, the lead times associated with infrastructure development mean that decisions taken now will shape the world of the future. The UK, for example, is debating investment in nuclear and renewables that will provide energy for the next generation, and is pushing forward on a high-speed rail project that will not be completed until the 2030's.

Thirdly, it is expensive. Globally, we must spend an estimated US\$40 trillion in the coming decades, merely to provide basic levels of infrastructure. Given that this investment is ultimately funded by you and me, whether through taxation or user charges, it is a check that must only be written once, and spent wisely.

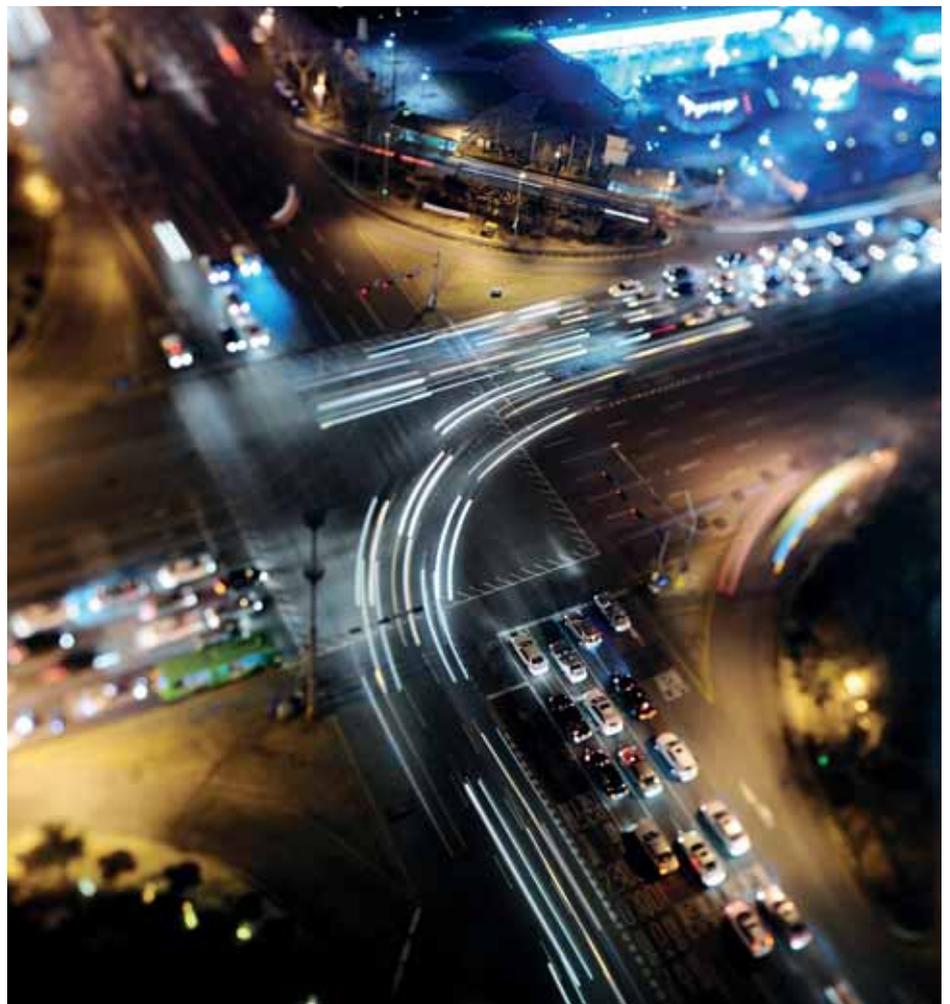
These challenges are not simply met with a shovel and a check-book. There are numerous complexities to be confronted as well.

The first concerns the question of who takes leadership of these issues. The answer – at least in recent generations – has been government. But governments around the world have already taken on a dizzying array of new responsibilities at a time of financial crisis, while also struggling to retain talent. Trust in government has fallen. In the US, a mere 19 percent now claim to trust government, down from 76 percent at the time Eisenhower was delivering the interstate highway system. A subsequent KPMG/EIU survey found that around 85 percent of both public and private sector respondents had concerns over governments' long-term ability to deliver infrastructure.<sup>2</sup>

Increasingly, therefore, government looks to the private sector as a partner. However, the private sector is also grappling with an evolution in capitalist thinking, meaning that effective models for co-working between the public and private spheres need to be devised.

The second great complexity concerns climate change. Governments and businesses must make vital strategic decisions now, and promote changes in behaviors and long-term thinking, before the speed and severity of changes are fully known.

The third great complexity concerns technology. New technologies, like high-speed broadband, are already part of infrastructure thinking. Innovations in wireless technology and building design will make infrastructure more efficient and sustainable. And, at a day-to-day level, industry best practice evolves to extend the life of assets and improve their performance. Planning must take account of these changes and the interdependencies between them – for example, between electric cars and grids.



The fourth great complexity is financial, in light of the recent global financial crisis. Put simply, where will US\$40 trillion of essential funding come from? To what extent do we pay through general taxation or through user charges? Financing is also an issue, but, provided sensible strategies and risk-sharing models are in place, solutions to this will follow. Thus, long-term decisions are being taken without many of the basic tools in place to inform them.

The fifth complexity concerns globalization and skills. Infrastructure is an issue of global concern and there are finite skills and resources at present to deliver infrastructure effectively. So, governments may plough ahead with major infrastructure investment and not always have the means to learn lessons from other markets.

The last great complexity concerns resilience and interdependency. Often, challenges are addressed in 'silos', reflecting the high degree of technical understanding required. Yet, as events in the Gulf of Mexico taught us, an isolated issue in one industry can precipitate crises across others. An increase in natural disasters or unpredictable events will test the resilience of infrastructure, not just in terms of reconstruction, but also in terms of disruption to supply chains.

These challenges and complexities are to be taken seriously. They are not going to disappear; indeed, they will define the age that we, and our children, live in. However, I am optimistic that these challenges can and will be tackled.

It is vital that those involved in the infrastructure market share global experiences, particularly with governments, to develop best practices.

It is also critical that effort go into developing methodologies that work, such as:

- planning tools for assessing the value of projects;
- effective risk-sharing models for procurement and financing;
- transparent data and sound management tools to ensure project delivery and efficient long-term operations;
- robust markets for infrastructure investment; and
- responsive systems of taxation.

Most importantly, infrastructure professionals must discuss these issues together and find a voice to explain these issues to governments and to the public. Working in infrastructure forces you to plan for the long-term and to realize that planning for the future must start today.

<sup>1</sup>*Bridging the Global Infrastructure Gap*, KPMG International/Economist Intelligence Unit, 2009.

<sup>2</sup>*The Changing Face of Infrastructure: public sector perspectives*, KPMG International/Economist Intelligence Unit, 2009.



# Africa

By Klaus Findt

Don't underestimate Africa; she will almost certainly be the next big infrastructure play.

Anyone that hasn't been to Africa in the past decade would be astounded by the pace of economic growth. The African population is expected to more than double to 2 billion by 2050. Her combined GDP now rivals Russia's, and is set to top US\$2.5 trillion within the next ten years.

While much of this growth has been tied to the rich resource deposits found throughout the continent, it has also been supported and encouraged by strong evidence of more stable governments, stronger financial systems and better economic conditions.

To support this accelerating boom, infrastructure investment over the next decade will largely focus on projects that enable further economic growth – most importantly transportation

and power generation. In fact, a 2009 World Bank report suggests that Africa will need to bring 7,000 MW of new generating capacity online, and spend approximately US\$43 billion each year, just to keep pace with the continent's future demand for energy.

Getting there will require African nations and sponsors to overcome a number of issues. First is a history of under-investment in existing infrastructure projects that has left many valuable assets in sub-standard condition. Africa will now need to spend more than US\$90 billion each year on infrastructure, but has access to only about half that amount. At the same time, while great headway has been made in almost every country, there is still a ways to go to achieve the institutional, regulatory and administrative reforms that will be required to support a fully-functioning infrastructure market.

While this will take some hard work and innovative thinking, one thing is certain: Africa is well on its way to becoming one of the world's next big infrastructure markets.

43  
billion

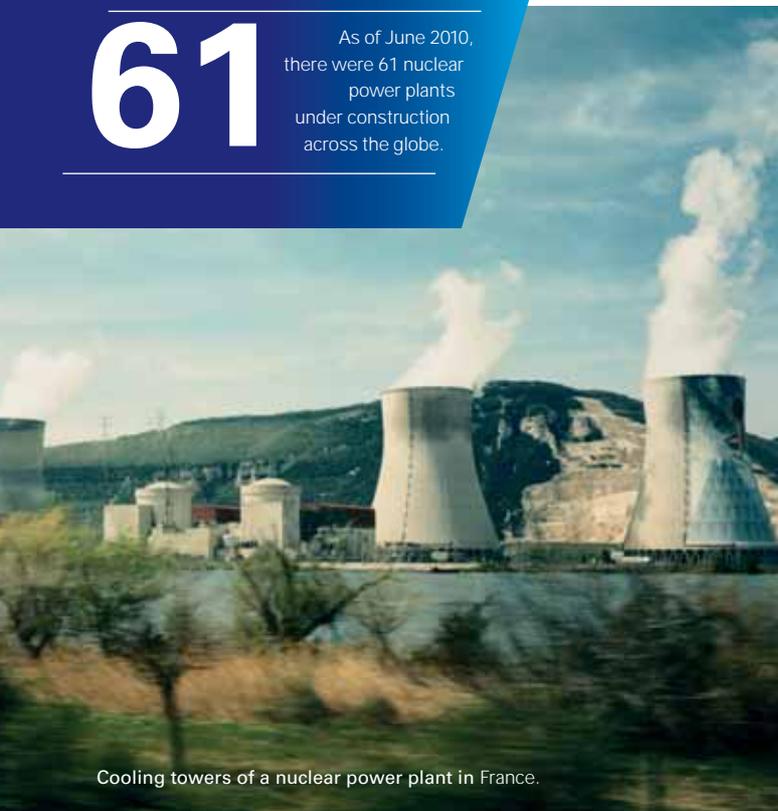
Africa will need to spend approximately US\$43 billion each year, just to keep pace with the continent's future demand for energy

Road through desert  
Namib Desert, Namibia.

# Meeting the Challenge of Decarbonization

# 61

As of June 2010, there were 61 nuclear power plants under construction across the globe.



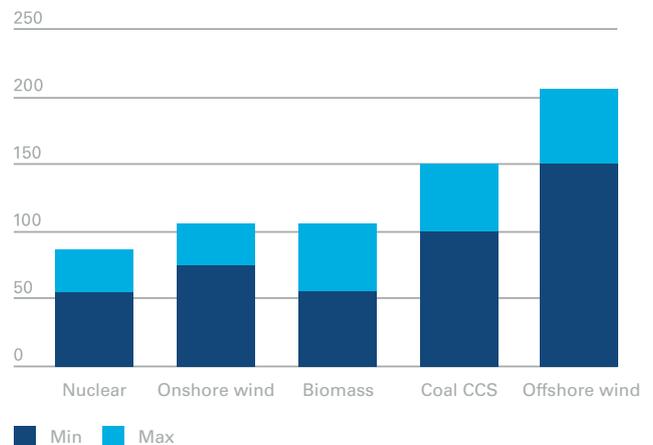
Cooling towers of a nuclear power plant in France.

By Dr. Timothy Stone

It is no longer a question of whether we must reduce our carbon footprint or not. The real question is how.

## Comparative cost of power sources

Levelised cost, £/MWh



Source: *Powering the Nation 2010 Update*, Parsons Brinkerhoff, 2010.

## Regional Spotlight

# Asia Pacific

By Graham Brooke

Few regions are as diverse as Asia Pacific. From the high-growth economies of China and Vietnam, to the developing nations of Indonesia and the Philippines, there is no doubt that the region has a desperate need for infrastructure. But finding ways to fund all of that work will pose a serious challenge to many countries who will increasingly find themselves competing against each other for each investment dollar.

Who will be providing that investment is another question altogether. Public Private Partnerships (PPP) projects are certainly gaining traction in Asia Pacific, particularly in Australia, New Zealand (see page 43) and Indonesia (see page 23), but private investment will need to increase substantially if the region is to ever catch up to demand.

With tight budgets and massive need, most markets will also need to dedicate significant attention to increasing the efficiency of infrastructure delivery, finding both proven and unique ways to squeeze the most value possible from their available funds. At the same time, many of the region's developing countries will also need to focus on building capacity within their government departments to manage increasingly complex deals and projects.

Asset sales will help close part of the budget shortfall, and the region will continue to see asset sales in almost every country (with the exception of China), particularly in the power sector.

Industry participants will also benefit from the increasing globalization of investments in this market, with many of the world's largest investors creating funds aimed specifically at the Asian market. Observers will also notice a growing level of outbound investment to places like Africa and Europe, though – for the time being – this is mainly isolated to investors from China, Singapore and Vietnam.

Reaching the world's 2050 goals for decarbonization will require a fundamental revolution in the way that governments, citizens and businesses approach power. It will take massive change, not just in the electricity generation sector, but in almost every facet of life.

Indeed, the pace and scale of the change ahead of us is unlike anything we have seen since the Industrial Revolution. And while big numbers are frequently tossed about, governments will quickly find that some of the biggest obstacles are actually related to long-term planning and skills requirements rather than the need for immediate access to capital. The road ahead will require massive levels of improvement in energy generation and efficiency – especially in the domestic and industrial markets – and a disciplined and organized approach to planning.

#### **All eyes on nuclear?**

In response, many governments are now looking to nuclear power to achieve long-term, low-carbon energy security. And justifiably so: when compared to other renewable sources such as wind, carbon capture or solar energy, nuclear is proving itself to be significantly more cost-efficient over the long-run, and much more reliable than other renewable options. And while nuclear will have to make up a

significant proportion of any rational energy policy for many countries, it will also require other complementary low-carbon generation technology in order to provide a balance between economics and security of supply.

the industry by focusing on training and education, building capacity within local suppliers, and implementing and approving standard designs (for more insight into the challenges facing new nuclear builds, see *Going Nuclear: The Atom's Renaissance* on page 16).

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## **Nuclear is proving itself to be significantly more cost-efficient over the long-run, and much more reliable than other renewable options.**

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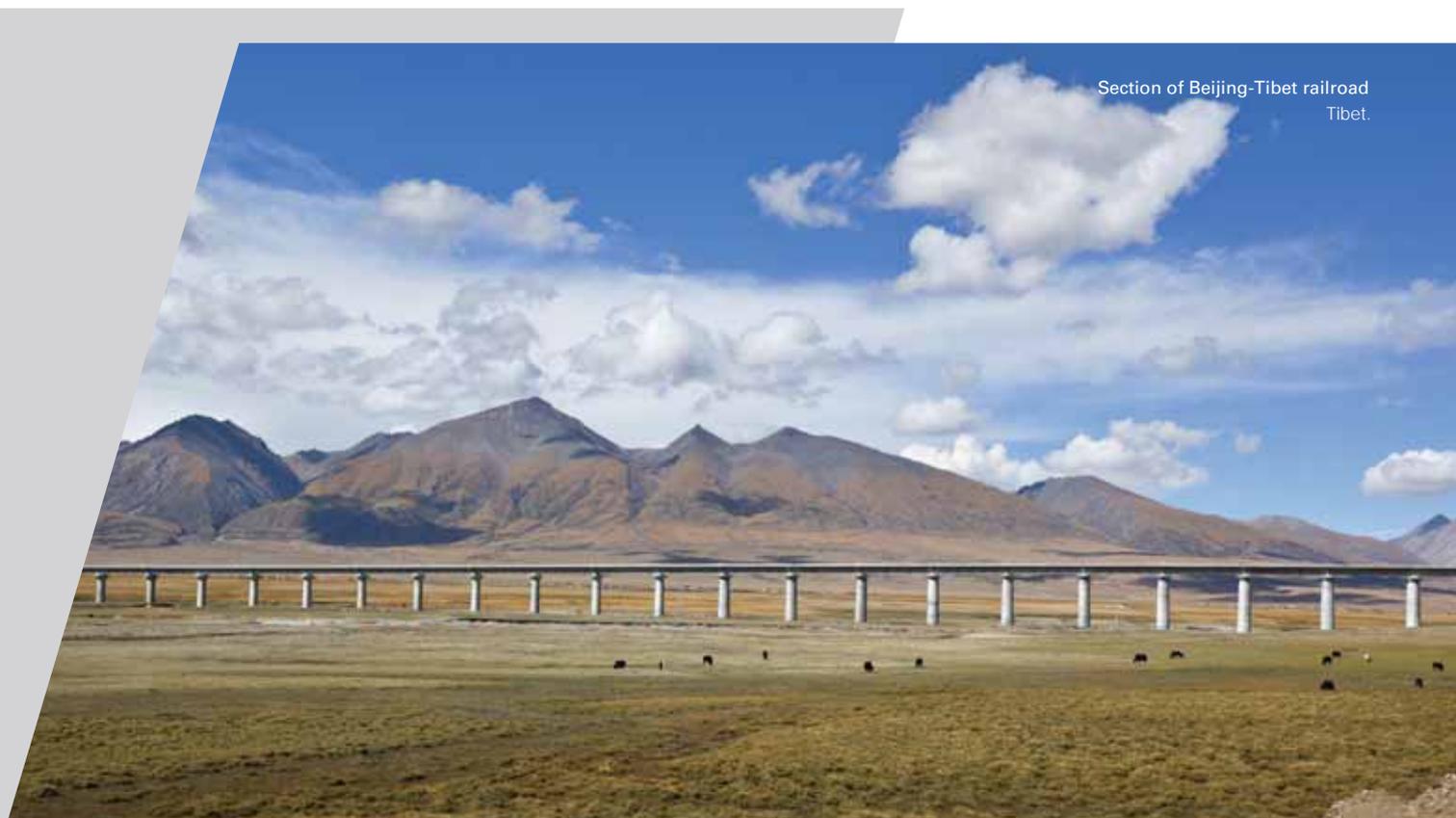
Nuclear is now built and operated to safety levels many orders of magnitude more stringent than any other aspect of life and is more highly-regulated and audited than virtually any other type of energy source available today. Indeed, other conventional energy industries – such as offshore oil exploration – now have much to learn from the safety culture that surrounds every aspect of modern nuclear power.

#### **The experience deficit**

But until recently, most of the world had been out of the nuclear business for more than 25 years, resulting in a significant shortfall between the skills, supplies and services that are available and what is now in demand. In most cases, closing this gap will require governments to 'prime the pump' of

Governments will also need to take a close look at their existing policy to find ways to reduce or eliminate (their self-imposed) risks related to political upheaval.

Most importantly, governments and their citizens must start thinking clearly about the long-run economic impact of energy choices ahead. If our goal is to leave a better world for our children – and certainly that is the ultimate goal of modern decarbonization efforts – then surely it is just as critical that we strive for a system that also prioritizes effectiveness and long-term cost efficiency.



Section of Beijing-Tibet railroad  
Tibet.

# Striving for Sustainability

## Q&A with Yvo de Boer

Whether you are in business or government, climate change and sustainability are clearly at the top of the global agenda. While last year's Copenhagen Climate Change Summit may not have achieved its ultimate goal of producing an international treaty, it certainly clarified minds about the importance of sustainability.

As the former Executive Secretary of the United Nations Framework Convention on Climate Change, **Yvo de Boer** knows the challenges facing the world if we are to achieve a goal of reducing CO<sub>2</sub> emissions by 80 percent by 2050.

We sat down with Mr. de Boer, now Global Advisor to KPMG member firms for Climate Change and Sustainability, to talk about the importance of sustainability to the infrastructure industry.

### **Q: What can infrastructure do to help achieve measureable progress on the issues of climate change and sustainability?**

A: Infrastructure, if intelligently designed, planned and delivered, is probably one of the best hopes we have of achieving a sustainable future against the impacts of climate change. On the global scale, governments are largely looking to infrastructure investments to deliver on most of their carbon reduction targets. Renewable and low-carbon power generation, efficient transit, smart distribution systems: all of these are going to be designed, built and even operated by infrastructure providers.

At the same time, infrastructure providers themselves have been stepping up to deliver on carbon emission targets. If you look at

the projects cited in the recent *Infrastructure 100* publication, you will see that there are some exceptional examples of projects that are currently underway where infrastructure providers have taken the lead in designing facilities that far surpass current sustainability requirements with an eye on building for the future. We've also been seeing some great strides in the development and adoption of new technologies that reduce the environmental footprint of infrastructure, such as energy efficient facilities and some of the recent carbon capture technologies.

In reality, much of our ability to respond to the challenge of climate change depends on whether we can deliver a massive amount of infrastructure in a very sustainable way.

### **Q: So what needs to change to kick-start that evolution?**

A: It really requires a fundamental mind-shift. For both government and industry, it should always come back to the question of how best to leverage sustainability to create and capitalize on opportunity. And we're starting to see that happen. Today, sustainability is quickly becoming the strategic lens through which both governments and businesses are viewing their respective futures.

In the automotive industry, for example, a number of car companies that were once opposed to environmental legislation are now seeing market opportunities in hybrid and electric vehicles. Chemical companies are looking at their track records in energy efficiency and how they compare against their competitors. In every sector – even airlines – we're seeing leaders emerge who view climate change not as a threat but as an opportunity for change.

The percentage goal reduction of CO<sub>2</sub> globally by 2050.

# 80

“Our ability to respond to the challenge of climate change depends on whether we can deliver a massive





View of Manhattan from The Rockefeller Center  
New York, US.

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“ Climate change and sustainability issues should be seen less as a risk to manage, and more as an opportunity for innovation and competitive advantage.”

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For infrastructure providers, climate change and sustainability issues should be seen less as a risk to manage, and more as an opportunity for innovation and competitive advantage. Many providers are already winning contracts based on their ability to deliver a more sustainable project than their competitors, and this trend is only going to continue.

With respect to government, it is increasingly important to look at achieving their objectives through the strategic lens of sustainability. That means creating policy that encourages long-term planning, refocusing procurement approaches to reward sustainability and securing funding that recognizes the ‘whole of life’ cost of infrastructure rather than just the design and build phases.

Government also needs to think more aggressively about environmental sustainability as an engine of economic growth. There are already countless examples of nations and regions that have capitalized on environmental trends to spawn new industries and drive more efficient industrial activity – and with the right financial engineering – the economic rewards can benefit the public and private sectors, as well as developed and developing nations alike.

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**Q: Can the world achieve a goal of reducing CO<sub>2</sub> emissions by 80 percent by 2050?**

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A: In my mind, it is not a question of whether we can achieve the target or not. The real question is how we achieve it.

One thing is certain: it will take government and business working together to have any real success. The scale of what is required is massive and simply isn't possible to achieve within the tight budgets and capacities of government alone. The growing popularity of Public Private Partnership models for infrastructure projects are a great first step, and there will need to be a lot more activity from government – and a lot more funding from the capital markets and private investors – to make any significant headway.

The good news is that governments are clearly focused on change. Copenhagen yielded aggressive CO<sub>2</sub> reduction targets. Action plans were submitted from every major industrialized nation and at least 35 developing nations – together accounting for more than 80 percent of energy-related CO<sub>2</sub> emissions. That is a significant success – and as government clarifies its commitment, business will deepen its engagement.



**Yvo de Boer**

Prior to joining KPMG, Yvo was Executive Secretary of the United Nations Framework Convention on Climate Change (UNFCCC).

Before joining the UNFCCC, Yvo was Director for International Affairs at the Ministry of Housing, Spatial Planning and Environment of the Netherlands. He also served as Deputy Director-General for Environmental Protection in the same Ministry, and Head of the Climate Change Department.

Yvo has been involved in climate change policies since 1994. He helped to prepare the position of the European Union in the lead-up to the negotiations on the Kyoto Protocol, assisted in the design of the internal burden sharing of the European Union and has led delegations to the UNFCCC negotiations.

Yvo has served as Vice-President of the Conference of Parties to the UNFCCC and as Vice-Chair of the Commission on Sustainable Development. Prior to joining KPMG, he was a member of the China Council for International Cooperation on Environment and Development, the Bureau of the Environment Policy Committee of the Organisation for Economic Cooperation and Development, and the Advisory Group of the Community Development Carbon Fund of the World Bank.

# Infrastructure in the Developing World: A Role for IFIs and Private Finance

By Timothy A.A. Stiles and Kate Maloney

No matter who you talk to, one of the greatest challenges facing infrastructure delivery is funding. For those in the developed world, it is a matter of prioritizing projects, managing budgets and encouraging private investment.

For many of the world's least developed countries, securing adequate funding for critical infrastructure projects is much more complex. These decision-makers must weigh budget allocations to infrastructure against a myriad of other equally critical challenges such as access to healthcare, "universal" education, independent police services, or basic social services. Markets are a critical part of the equation. Public sector authorities and government decision-makers are focused on stabilizing macroeconomics and ensuring sound fiscal footing – including the payback of sovereign debt. International Financial Institutions (IFI's) play a critical role in supporting this effort.

For the past 50 years, IFIs have been working throughout the developing world to create stable and sustainable markets that provide the platform for economic growth and poverty reduction. But sustained economic growth cannot be achieved without a robust infrastructure platform. Indeed, since the recent upheavals in the financial markets, we have seen greater focus on infrastructure investment as a critical component for sustained economic growth in developed countries.

As a result, IFIs have increasingly expanded their support to target priority infrastructure projects within their developing countries as a means of providing greater economic benefit to local populations. Given the fact that

the 'moral imperative' of most IFIs is to improve the standard of living for those in poverty, infrastructure is often seen as a high-value and long-term development investment.

While IFI's have traditionally played a prominent role in policy and financial support for large scale infrastructure projects, they – like other sectors in the market today – are starting to see a shift towards increased engagement with the private sector through Public Private Partnerships (PPP).

Ultimately, the role of private investors is beginning to change the way that IFIs approach infrastructure, and at the same time, the way infrastructure providers approach the developing world.

## The debate over the private sector's role

The role of the private sector in IFI-supported infrastructure projects is a hotly debated topic. On the 'pro-private' side are a growing number of IFIs, government officials, and enterprises that believe IFI-supported projects could benefit from private capital, skills, and experience. On the other side of the debate is a more traditional lobby which believes a separation must be maintained between the private sector and international development work in order to preserve the IFIs' adherence to their humanitarian-minded missions.

Traditionalists have a number of valid concerns. Wary of the for-profit model,



Construction workers building a road  
Darcha, India.

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many IFI stalwarts voice deep concern about the ability to maintain a pure focus on humanitarian outcomes when investing in financial partnership with the private sector. While the majority of private enterprises involved in the wider international development sector are certainly interested in helping the poor and under-served populations of the world, they simultaneously face bottom-line pressure from shareholders for a strong return on investment (ROI). The traditionalists may claim that ROI pressures result in decisions that over-look or mask true development outcomes and needs.

Take microfinance, for example: some of the poorest people in the world now have access to low-interest loans that are undoubtedly providing economic and social benefits to those that need them the most. But the financial backers of microfinance schemes are also seeing returns that rival and exceed even the best ratios in the private market of both developed and developing countries.

Both camps have a valid point. Certainly private finance has the potential to bring more efficiency, better value, a “capital markets” approach, and enhanced accountability to IFI-funded infrastructure projects in a number of

ways. For one, the infusion of private capital enables the IFI to ‘free up’ additional resources to put towards other critically important projects (potentially in a different region or country). Private capital also increases the level of accountability by applying a more rigorous and transparent due diligence process that reflects the private sector’s acute pressure to help ensure their investments are sound (although certain IFI’s would protest their due diligence procedures are fully accountable and transparent).

IFI-supported infrastructure projects also benefit from the technical experience and creativity of the private sector, especially in structuring sustainable financing models. It would be hard to argue, for example, that IFIs would be better off without the experience and advice of private sector gurus.

With a single-minded focus on the ‘bottom of the pyramid’ (i.e., those that earn less than a dollar a day), many within the IFI community are concerned that the increased presence of private sector funding in developing country infrastructure projects will increase the pressure on user fees and thus undermine the economic sustainability that these key projects aim to deliver.

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Private finance has the potential to bring more efficiency, better value and enhanced accountability to IFI-funded infrastructure projects.

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Water supply  
Kenya, Africa.

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“Aid is a means to an end, not an end in itself... it is the private sector that must take the lead in creating jobs and opportunities.”

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Again, there is just cause for concern. IFIs already navigate the conflicting objectives between donor governments, recipient governments and their own individual charters. Introducing a financial ROI motive may muddy the waters and – in some cases – create insurmountable conflicts of interest. If left unaddressed, this may lead to the benefits that come from IFI support of infrastructure projects becoming diluted.

#### Identifying mutual opportunities to support infrastructure development

A number of IFIs and development agencies are increasingly recognizing the importance of private sector participation in development. In a recent speech to the London School of Economics, the UK Secretary of State for International Development, Andrew Mitchell, declared, “Aid is a means to an end, not an end in itself... it is the private sector that must take the lead in creating jobs and opportunities.” He went on to say that “I want the Department for International Development to learn from business.”

While the infusion of private capital is a relatively new trend for the development community, there are already a number of examples where PPP are delivering great success for both IFIs and private investors. Take the outstanding work of the Bill and Melinda Gates Foundation in conjunction with CGAP (Consultative Group to Assist the Poor), for example, or the results of the GAVI Alliance (Global Alliance for Vaccines and Immunisation) at the World Health Organization.

At the same time, a growing number of private infrastructure developers are applying to the IFIs for project funding in the developing world. In response, most IFIs have created private sector funding models that are structured quite differently

from their traditional development transactions. And while the expectations of IFI Board funding applications are often cited as complex and laborious when compared to the pursuit of traditional capital, the IFI's contribution to the financing structure of an infrastructure project – in the form of sovereign risk protection, sub-debt, or credit facility – creates an appealing risk-sharing mechanism for the private sector.

#### Understanding each other's motivations

Over time (and with the added pressure of increased demand for infrastructure), it is likely private participation in IFI-supported projects will become more common around the world.

However, if the focus is to remain on helping the ‘bottom of the pyramid’, hard work and cooperation from all parties – both public and private – is critical. One way to facilitate this is by structuring due diligence processes that look at pre-funding decisions and post-funding outcomes to ensure that projects are addressing the needs of the people, providing the services promised and making the best use of resources. Most importantly, both the public and private sectors will need to work together to make the most of their common ground in a way that satisfies everyone's objectives and mandates.

And while the jury may still be out on how to appropriately incorporate private capital and incentives into IFI-supported infrastructure projects, one thing is certain: IFIs will continue to be one of the most important sources of funding to solve the developing world's challenges.

# North America

By Stephen Beatty

North America faces some significant infrastructure challenges over the next decade. Across great swaths of the continent, particularly in the east and the north, infrastructure is in desperate need of renewal. In these regions, governments are increasingly recognizing that their traditional methods of funding failed to address the full lifecycle cost of infrastructure. With significant investment now needed to rehabilitate aging facilities, governments will increasingly need to sink new money into existing infrastructure, just to maintain existing service levels.

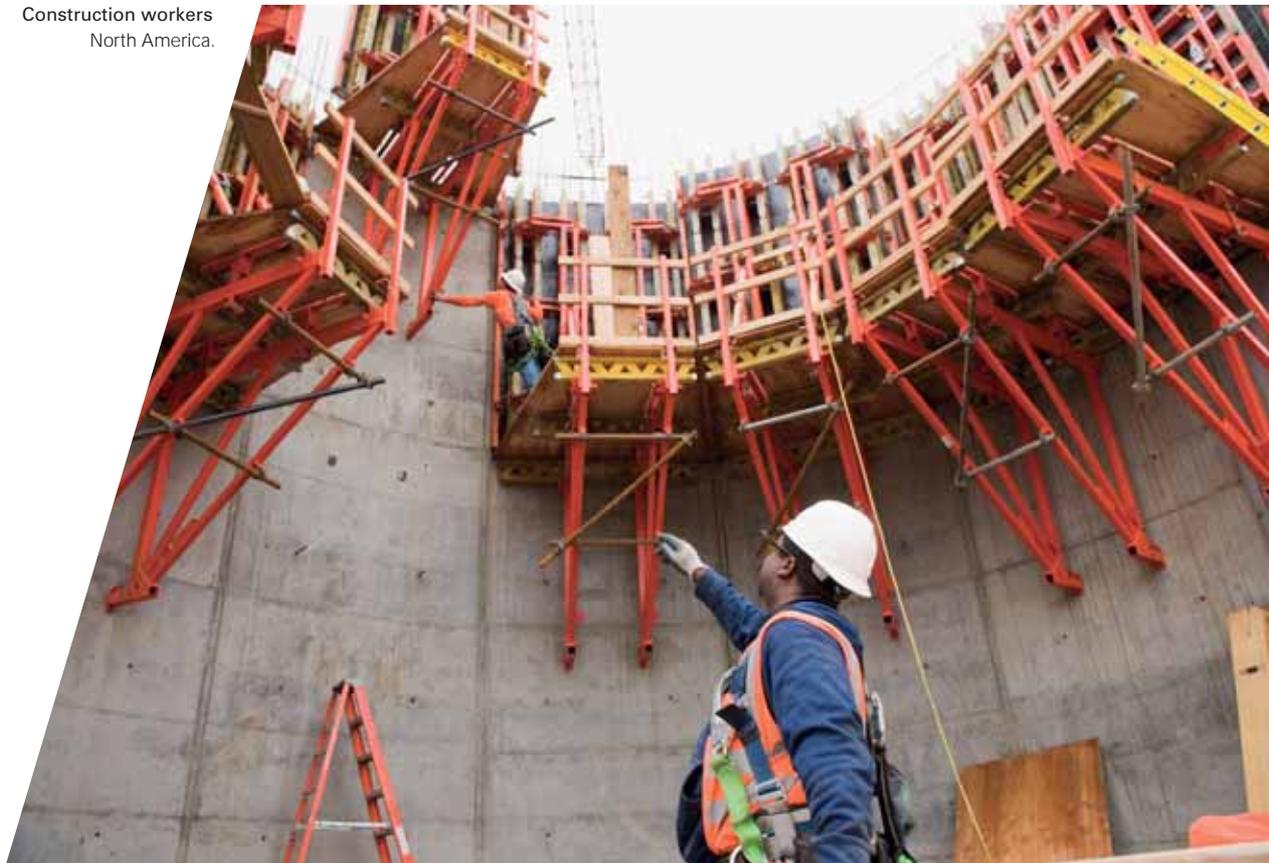
For the south and west of the continent, the story is one of exponential growth. But as populations shift into these regions, an already stretched water supply will need to be expanded and solidified before any further significant development can really happen. If the critical water situation can be remedied, roads, power and other infrastructure will quickly grow with the development of these regions.

And while credit markets have certainly eased, the industry continues to deal with the impact of constricted credit markets. Where individual infrastructure projects were once funded by a small group of relatively deep-pocketed banks, it now takes upwards of ten banks (each with reduced allocations) to get a deal closed.

At the same time, the financial crisis has also reduced demand for infrastructure as scaled-back economic growth rates lead planners to cancel projects that – in boom times – had been priority issues. While this knee-jerk reaction is understandable, it is also a terrible mistake.

Growth will return. Populations will expand. Demand for infrastructure (particularly power) will increase. These are facts. And if we are to leave any lasting infrastructure legacy for our children, we must start thinking about society's needs for 2050 rather than the comptroller's needs for 2011.

Construction workers  
North America.



# Going Nuclear: The Atom's Renaissance

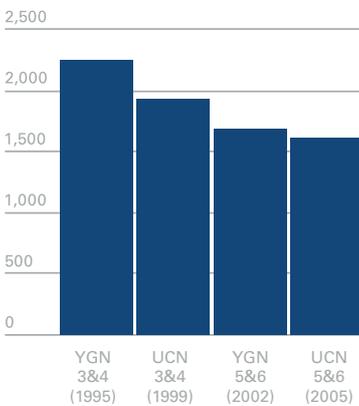
By **Geno Armstrong**

The nuclear industry is enjoying a renaissance. With carbon reduction policies and questions of national energy security at the top of the global agenda, countries are increasingly looking to nuclear power for a low-cost alternative to fossil fuels. And with 61 new nuclear plants currently in design or under construction around the world<sup>1</sup>, there is little doubt that demand for nuclear services, technology and experience will continue to run high for the foreseeable future.

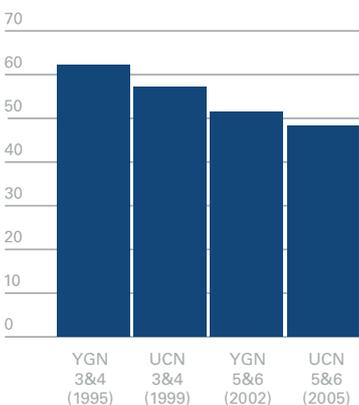
Building and operating nuclear plants is both a high-value and a high-risk proposition for utilities, investors and contractors. With a reputation for significant delay claims, cost growth, and – ultimately – investor disappointment, nuclear projects are notoriously hard to deliver with any real price certainty. As we can see

## South Korea cost and time reductions through standard design

Overnight cost (\$/kW)



Construction duration (months)



Source: *Building New Nuclear Plants to Cost and Schedule – An International Perspective*, Westinghouse, Sep 2005.

from the current situation in the US, even projects that claim to have a level of ‘price certainty’ can’t always deliver on these guarantees once the project actually gets rolling.

Regardless, most Engineering-Procurement-Construction (EPC) contractors are reluctant to accept risks that are unmanageable or unpredictable, which will continue to put pressure on utilities and other project owners to achieve price certainty in the future.

## Standard designs, superior outcomes

Some governments have found that a far simpler way to achieve price certainty over the long-term is to focus on standardized designs. Besides greatly reducing the level of risk involved in each consecutive nuclear new build project, standardized designs also allow contractors and service providers to build valuable capacity and experience which can be applied to future projects.

In China, for example, government authorities have unveiled plans to

increase nuclear generating capacity to 70 GW within the next decade, and 150 GW by 2030. To achieve these goals, two dozen new plants will need to be built, and – while the first phase of new builds will rely on foreign experience and technology – future phases will be led by local contractors with transferred and tested technology, designs and experience.

## Tapping the public coffers

Between the US approach (where government loan guarantees help to reduce the utilities’ financial risk and exposure) and the China approach (where government funds, procures and manages the entire process), there are a number of governments that take on various levels of risk, working with favored national contractors and suppliers to help ensure projects are delivered on time and to regulation. For example, Japan, Korea and Russia each provide a level of financing for nuclear new builds through direct and indirect support of their national contractor and supplier networks. The United Arab Emirates has taken a somewhat different approach by “outsourcing” its initial nuclear development program to a consortium of Korean companies that will design, build and operate four nuclear units at a single site for 60 years.

Ultimately, the key to delivering nuclear power projects is to recognize that everyone – the utilities, the EPC contractors, the Nuclear Steam Supply System (NSSS) suppliers, operators and governments – will need to bear some level of risk. How that risk is allocated among the parties will decide whether nuclear new build projects can be delivered on time and on budget.

<sup>1</sup>Nuclear power plants world-wide, in operation and under construction, as of June 30, 2010, European Nuclear Society, 2010.



# Emerging Infrastructure Markets: Egypt

El Corniche and city beach  
Alexandria, Egypt.

By Darryl Murphy

Throughout the Middle East and North Africa, pundits are talking up the merits of delivering large-scale infrastructure projects through Public Private Partnerships (PPP). But across the region, Egypt stands out as the only country that has made any real headway in creating an active PPP program.

Historically, Egypt's government has been the sole provider of public infrastructure. But with a rapidly increasing population and expanding economy, the country is now looking to reform the public sector and reduce the level of government debt through innovative financial strategies, including the use of alternative procurement methods.

Recognizing the potential benefits of PPP, Egypt's Ministry of Finance established a 'PPP Central Unit' (PPPCU) in 2006, dedicated to coordinating all of the country's PPP projects to ensure their successful delivery. Currently, the PPPCU manages a development program that plans to invest US\$15 billion between 2009 and 2013. The list of projects spans a wide range of basic services such as water, waste management, road building, health, education and transportation.

Beyond fundamental project management, the PPPCU also fosters better PPP practices across the country by resolving any issues that arise through the programs, and acting as the final arbiter for projects being put forward by the various government ministries. The PPPCU has also been blessed with very capable and

experienced leadership in the form of Rania Zayed, a great advocate and supporter of the PPP model within Egypt and the wider Middle East.

There have been a number of recent high profile milestones that lend more credibility to Egypt's strategic infrastructure plans. For one, the government has recently enacted new PPP legislation that will provide a strong framework for the efficient implementation of PPP in accordance with international best practices. At the same time, a number of significant projects are achieving key successes in planning, designing and funding major initiatives. For example, the New Cairo Wastewater deal recently reached financial close, and new projects are already being planned, including the Rod El Farag highway project (a 34 km,

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Egypt will almost certainly lead the region in the growth of new infrastructure projects over the next decade.

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8 lane connector route requiring two major bridges across the Nile), and the Abo Rawash Waste Water Plant (a 1.2 million m<sup>3</sup>/day facility) upgrade.

Having proven their commitment to creating the right environment for PPP infrastructure models, Egypt will almost certainly lead the region in the growth of new infrastructure projects over the next decade.

GDP	<b>\$469.8 billion (2009 est.)</b>
Population	<b>80,471,869 (July 2010 est.)</b>
GDP/Capita	<b>\$6,000 (2009 est.)</b>
Airports (paved)	<b>73</b>
Railway	<b>5,500 km</b>
Roadway (paved)	<b>47,500 km</b>
Electricity Production	<b>118.4 billion kWh (2007 est.)</b>
Urban Population	<b>43%</b>

# High Speed Rail: Going places .... quickly

By Daniel Loschacoff

High Speed Railways (HSR) are widely regarded as one of the most significant technological breakthroughs in passenger transportation in the past 50 years. Not only have they proven themselves to be safe and reliable; they are often very successful in competing on price, comfort and travel time with both air and road transportation.



# 250

HSRs typically travel at speeds in excess of 250 km/hr

Typically, HSR refer to any railway that is capable of transporting trains at speeds of 250 km/hr or more. In Japan alone – where HSR trains are called ‘bullet trains’ and were first introduced in 1964 to coincide with the Tokyo Olympics – the HSR network now consists of some 2,459 km of track carrying over 335 million passengers per year. More than 100 million passengers travel on France’s HSR of almost 1,900 km of new interconnected high-speed lines. By some estimates, total HSR track in operation around the world is expected to rise from a current level of around 10,000 km to more than 25,000 by 2020.

While much of the historical activity around HSR has been focused around lines in Asia (servicing Japan, China, Korea and Taiwan) and a fully compatible network of lines in Europe (primarily in France, Germany, Spain and Italy), many of the upcoming HSR projects are increasingly being found in other geographies, including projects in Africa, Russia, the Middle-East and the Americas.

## Reviving the rails

Since the earliest projects started commercial operation, high speed rail has usually been presented as a success story in terms of both demand and revenues. Many countries also see HSR as the key catalyst driving the revival of rail traffic, breathing life back into a declining business that had lost its momentum under fierce competition from road and air transportation. And while many traditional rail lines continue

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## HSR divisions are often seen as the only division capable of recovering operating costs.

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to present a losing proposition for rail companies, HSR is often seen as the only division capable of recovering operating costs, though not usually all of their infrastructure investment.

In reality, HSR is a highly complex and expensive project to build, maintain and operate. Managed poorly, the cost of an HSR project could substantially compromise the financial resources of a country for decades. In fact – in terms of size, cost and scale – HSR more closely resembles a nuclear power plant build than a traditional railway.

And like any other mega-project of this scope, the past is littered with examples of cost and time overruns, mid-stream contract renegotiations and even full cancellations of contracts in some cases. Projects are often also complicated by inexperienced project promoters who focus more on the engineering side of the project than on the long term delivery of a high quality service and its commercial value.

However, many of today’s projects have learned from the expensive mistakes of the past, to design, build and operate more efficient and value-driven high speed rails.



Bullet train arriving at station  
Japan.

HSR is a highly complex and expensive project to build, maintain and operate.

### **RAVE speeds ahead**

One such example is the RAVE project<sup>1</sup>, currently underway in Portugal. RAVE (Rede Ferroviária de Alta Velocidade, S.A.) is a sole-purpose company created by government decree at the end of 2000 to conceptualize and construct the country's high speed rail network. With the ultimate objective of developing a 650 km HSR network to link the country to Spain and the rest of Europe, RAVE began project planning in earnest in 2005. After an in-depth analysis of different strategies, financing options and PPP contract management approaches, the RAVE team defined a strong business case to govern how the transportation, budgetary and policy objectives of the government would best be achieved.

The project has been overseen by a professional and dedicated organization, focused on achieving a sophisticated hybrid financing mix with the right risk allocation to meet their objectives. Earlier this year, the project distinguished itself by being the first successful closing of a multi-billion euro transaction since the height of the financial crisis.

### **Staying on track**

Given their size, future HSR projects will increasingly need to justify their approach both technically and financially in order to obtain the necessary political approval and be eligible for specific grants or loans.

However, the traditional way of managing procurement and risk allocation is increasingly being seen as inefficient and unworkable for promoters with limited capacity, experience and funding. Instead, innovative project structuring, with a view on ridership risk and performance based payments –

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### **Further consolidation on the infrastructure, rolling stock and**

as well as the development and management of contractual arrangements based on the long term provision of HSR services – will grow in importance in future HSR projects.

A number of private HSR developers are already active worldwide and a further consolidation on the infrastructure, rolling stock and the operations side is expected. Investors will also start to tap into this market either through new projects or by acquiring part of the developing secondary market.

For governments, HSR developers, their promoters and advisors, these developments will almost certainly change the way they approach HSR delivery in the future.

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This article has used text and information from *A review of HSR experiences around the world*, by Javier Campos, Gines de Rus and Ignacio Barron, Fundacion BBVA, 2007.

# Demystifying Urban Transport Success

By Richard Threlfall

Were you stuck in traffic today? If you are one of the 3 billion people that now live in an urban setting, chances are that you are spending more and more of your time in rush-hour congestion.

It's not just slowing you down from getting home at night. Urban transport issues are also driving up the cost of your groceries, dragging on your business' growth and delaying urban development. And it's not just a problem for governments to sort out. According to a recent study 90 percent of executives say that the availability and quality of infrastructure affects where they locate and expand their businesses.<sup>1</sup>

projects suggested to us that perhaps, despite all the complexity, there might be some common denominators of successful projects. To explore this further we asked a team of renowned experts at the Imperial College London and the London School of Economics to undertake research covering urban transport projects worldwide, in cities as diverse as Bogota, Hong Kong, Paris and Manila, to name a few.<sup>2</sup>



But urban transportation projects are notoriously difficult to plan and execute. They have long lead times, face huge planning issues, are complex to procure, challenging to operate and usually exceedingly expensive. They promise to make a difference to the lives of millions of people, but they come with the scope to go seriously wrong and potentially even bankrupt a city.

## A recipe for success?

KPMG's experience with some of the world's largest urban transport

The study used statistical techniques to consider the relationship between key outcomes and underlying success factors. Of course, success means different things to different people. So we looked not just at financial success but also whether a project met its policy objectives and whether initial success had endured.

Achieving financial success requires the project to not only be completed within budget expectations, but also to meet the revenue generating goals set by the



project owners. While many factors can affect financial success (ridership/usage numbers, inflation, scope change, etc.), these risks can often be transferred through Public Private Partnership (PPP) arrangements that can reduce (but caution, not normally eliminate) the impact on the project owner.

Projects that fail financially can still be considered a success if they meet their original policy objectives (for example the London Jubilee Line Extension). However, policy objectives can sometimes change

dramatically between the time a project is announced and the ribbon cutting ceremony, so a project's ability to achieve policy success is always a bit more subjective.

The other critical measure of success for urban transportation is the project's durability. This reflects not only the physical durability of the infrastructure itself, but also the project's ability to operate and maintain itself effectively, and its ability to be replicated in other locations or transportation sectors.

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The effectiveness of procurement and financing is a key success factor for urban transport projects

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## Prioritizing procurement

The conclusions of the research were striking. Of six key success factors investigated, only one provided a statistically significant positive correlation – and that was the effectiveness of procurement and financing. This correlation transcends the hugely different policy environments of different countries, different cultures, different governance, and different business environments. It rises above the fact that Singapore, for example, has a highly integrated authority, whereas Bangkok has a relatively weak authority and New York has a highly fragmented authority.

Of equal note was the lack of significance of some factors and the suggestion of a negative correlation between the role of national governments and project success. National governments can be critical to providing the funding for urban projects, but inappropriate “guidance”, bureaucratic processes, conflicting priorities and confused accountabilities can be a toxic mix for trying to steer a difficult project through a decade or more of development.

Overwhelmingly, history points to one central tenet of successful urban transportation development: projects led by a unified central authority, and which take a considered approach to financing, procurement and operations will always have the highest chance of success.

<sup>1</sup>*Bridging the Global Infrastructure Gap: Views from the Executive Suite*, KPMG International, 2009.

<sup>2</sup>*Success and Failure in Urban Transport Projects*, Glaister, Allport, Brown and Travers, KPMG

## The checklist for project promoters for urban project success is as follows:

### 1. Effective procurement and financing are crucial

- Decisions about the procurement method should not be taken too early, but must be the result of a robust business case and/or feasibility study. Effective procurement and financing is very important to success, and the underperformance of urban transport projects can usually be traced back to an initial poor procurement decision. While Public Private Partnership arrangements are justifiably gaining popularity due to the low capital requirements for project owners and their ability to effectively allocate risk, each project will need to carefully select their financing model to meet the specific circumstances of their unique situation. There is no one-size-fits-all. And blindly copying from another country or city is always a recipe for disaster.

**2. Project planning matters** - Project planning needs to be rigorous, and should combine technical expertise with political sensitivity and engagement with stakeholders. Planning should include involving the private sector in ‘reality checking’, particularly relating to the financing of projects.

**3. Strategic consistency, not short-term opportunism** - For authorities to deliver real civic benefits from transport projects, they must set a long-term path and then work continuously towards it. The Dublin 21 Transport Plan is one of the best examples of a strategic, city-wide transport blueprint to be implemented gradually.

**4. Legitimacy counts** - Unless local people understand what is being done and why, there is likely to be limited support – and thus political legitimacy – for a project. All major projects will go through multiple and major challenges before they are delivered, and without legitimacy, politicians are often unable

to sustain either the resources or the delivery mechanisms required to successfully deliver the project.

### 5. Transport projects require authority

- The political institutions that make decisions about urban transport infrastructure projects need to also have the authority to drive them through. In other words, decisions about projects must be made by bodies that can command the powers to ensure they can be delivered. This may sound obvious, but in many cases around the world, the desire of authorities to deliver transport projects exceeds their ability to do so.

### 6. Governments should provide clarity and predictability

- National governments need to define rules for the disbursement of central funds that forces accountability upon authorities. They should also provide some predictability about the required process to secure future funding, and its availability for projects that meet its criteria.

### 7. Public authority competence must be maintained

- Where private contractors and project managers are used, it is just as important that the public sector authority is knowledgeable and effective, otherwise there is a serious risk that expertise within the public sector will weaken, leading to projects that may not be specified well, or contracts that may not be drawn up or managed effectively.

### 8. Project development should have a clear focus on its ultimate operation

- Too often, the dominant focus of project development is the physical implementation of the project, not their successful operations. Examples abound but Croydon Tramlink is one of the best known in the United Kingdom where a failure to integrate bus and tram operations from the outset ultimately bankrupted the scheme.

# Emerging Infrastructure Markets: **Indonesia**

100 PPP projects valued at more than US\$47 billion are tapped for investment between 2010 and 2014

# 47 Billion

By **Graham Brooke**

Indonesia is rapidly becoming the darling of the Asian infrastructure market. With a strong track record for successfully delivering complex infrastructure projects, particularly in the water and power sectors, Indonesia is looking to build on its experience to reinvigorate other key sectors as well.



The stage is certainly set for remarkable advances. For one, the government has been diligently setting up a detailed Public Private Partnership (PPP) framework to facilitate private investment in both economic and social infrastructure. The National Development Planning Agency has also published a list of more than 100 PPP projects valued at more than US\$47 billion that are tapped for investment between 2010 and 2014. That includes a high priority list of projects covering toll roads, mass-transit systems, water supply and solid waste processing.

The government has also recently taken steps to design and pass regulations that provide greater financial security to private investors and improve the land acquisition process, both of which had been frequently cited by the international infrastructure community as potential stumbling blocks to investment. Another significant change is the restructuring of the government agencies responsible for infrastructure to bring them under the direct oversight of the President. This has allowed practices to be shared between agencies, bringing more efficiency and consistency to PPP models across a number of sectors. At the same time, the Indonesia Infrastructure Guarantee Fund has been active in providing government backed guarantees for emerging infrastructure projects, reinforcing the government's commitment to the industry.

Indonesia has also participated in – and hosted – a number of high profile infrastructure summits, leveraging these events to announce and promote its portfolio of PPP opportunities. And with a historically high preference for Build-Own-Operate-Transfer (BOOT) contracts, many of Indonesia's earlier rounds of PPP projects are now also fuelling a growing secondary market for assets in power, roads and water facilities.

While many Asian nations continue to be passed over for investment due to sovereign risk concerns, there are a number of international aid agencies operating in Indonesia – such as the World Bank, AusAID and the Asian Development Bank – who take a part in facilitating investment through credit guarantees and other credit vehicles.

Over the next five years, Indonesia will continue to focus on power and water projects, but will put an increasing emphasis on a wide variety of transport projects, including mass-transit systems and freight networks aimed at increasing the flow of raw materials to market. Rail projects will be a particular focus, linking airports to cities and coal mines to ports.

With substantial overseas interest, fairly predictable and transparent PPP regulation, and a low level of sovereign risk, Indonesia will almost certainly win a disproportionate share of the world's future infrastructure investment.

<b>GDP</b>	<b>\$962.5 billion (2009 est.)</b>
<b>Population</b>	<b>242,968,342 (July 2010 est.)</b>
<b>GDP/Capita</b>	<b>\$4,000 (2009 est.)</b>
<b>Airports (paved)</b>	<b>171</b>
<b>Railway</b>	<b>8,529 km</b>
<b>Roadway (paved)</b>	<b>258,744 km</b>
<b>Electricity Production</b>	<b>134.4 billion kWh (2007 est.)</b>
<b>Urban Population</b>	<b>52%</b>

# Infrastructure Funds: Ready to Ride Again

By **Tony Rocker**

Have infrastructure funds had their day? Certainly not. There are challenges still to be met, but obvious signs of recovery are already evident and – with increased transparency and realism – should bring clear opportunities for growth.

Already we have seen some rather large deals reappearing in the market with significant assets sales in Europe, led by Endesa and Gas naturale in Spain and, most recently, HSBC Rail, EDF and High Speed One in the UK.

So while the financial crisis seriously dented many investors' confidence in infrastructure funds, the funds themselves are clearly back in business and looking for opportunities to invest capital that has been sitting on the sidelines for too long.

## Over-optimism

One of the problems in the past was that the performance potential of these funds was overstated, or at least over-rated. The perception developed – encouraged, it must be said – by early marketing rhetoric suggesting that they offered equity-type performance with bond-type security. Not surprisingly, these 'recession-proof' assets proved extremely popular. Equally unsurprisingly, the realization that this was an over-optimistic view has caused some disappointment.

But the reality is that infrastructure funds are assets like many others. Listed structures will always be reasonably closely-correlated with the performance of equity markets, and both have suffered equally from the financial crisis. Highly-g geared fund structures have found it harder to maintain cash flow and service debt when underlying assets cash flows have been affected.

A more realistic assessment of the comparative attractions of infrastructure investment shows that they should not have been considered as totally recession-proof in the first place. It

is inevitable, for example, that lower trade output will result in lower port throughput, and depressed industrial activity will lead to reduced water and power usage.

Once you disentangle the specific impacts of the current crisis from the fundamentals underpinning the sector, it seems that infrastructure funds are still a sound investment class which can play a significant contribution in many diversified portfolios with a focus on long-term performance.

But despite the crisis (and the inevitable problems faced by the more highly-g geared funds) virtually all the infrastructure funds developed over the last decade remain in business, with cash to invest in the right opportunities, and with few signs of extreme stress.

## Challenges remain

In a market where debt availability is constrained, funds continue to find it difficult to price their equity investments. There is still a mismatch between buyers' and sellers' price expectations. As a better balance returns to the system, this gap should close, but it will take a little more time.

More fundamentally, there are threats emerging to the basic business model of infrastructure funds, as pension funds in Canada, Australia, Netherlands and the State of California, for example, turn to direct investments in infrastructure. Could more follow suit, and conclude that they don't need the complexity - or cost - of an intermediate fund manager?

I think it's unlikely to be a serious threat. Infrastructure assets need active operational management and decision-making, over a sustained period of time. They are not buy-and-leave-alone

investments. Infrastructure funds bring expertise and focus to the sector. They also allow investors to gain exposure to significantly diversified portfolios of assets.

In general, infrastructure assets involve large individual investments, which effectively limit the scope for all but the largest pension funds to control risk through diversification and active asset management. The value of active fund management is well-established in other sectors; in infrastructure, as the underlying assets get larger, the case is stronger still. Many investors will pay a fair premium for its benefits.

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Infrastructure funds  
are still a sound  
investment class

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### Underpinning confidence

It is clear that the sector will continue to perform well for the rest of 2010, and well into 2011. Asset sales will continue unabated as cash-stripped governments seek to balance their books, bringing valuable opportunities to the market in almost every sector. In particular, the energy industry will continue to stand out as the focus of most of the global activity.

The developed world has a number of well-publicized infrastructure needs that will require funding as populations continue to grow and infrastructure continues to age. The developing world, too, has a long list of capital-intensive projects that are quickly gaining the

interest of a relatively new spate of funds focused on specific developing world markets.

The underlying need for expenditure on infrastructure remains: the Organisation for Economic Co-operation and Development (OECD) estimates that US\$2 trillion per year will need to be invested over the period to 2030. Many governments in the developed world have focused on supporting this as part of their response to the recession.

Perhaps one of the most encouraging signs is that new infrastructure funds are being established, and that new capital, including private equity, is flowing into the sector: Carlyle Group,

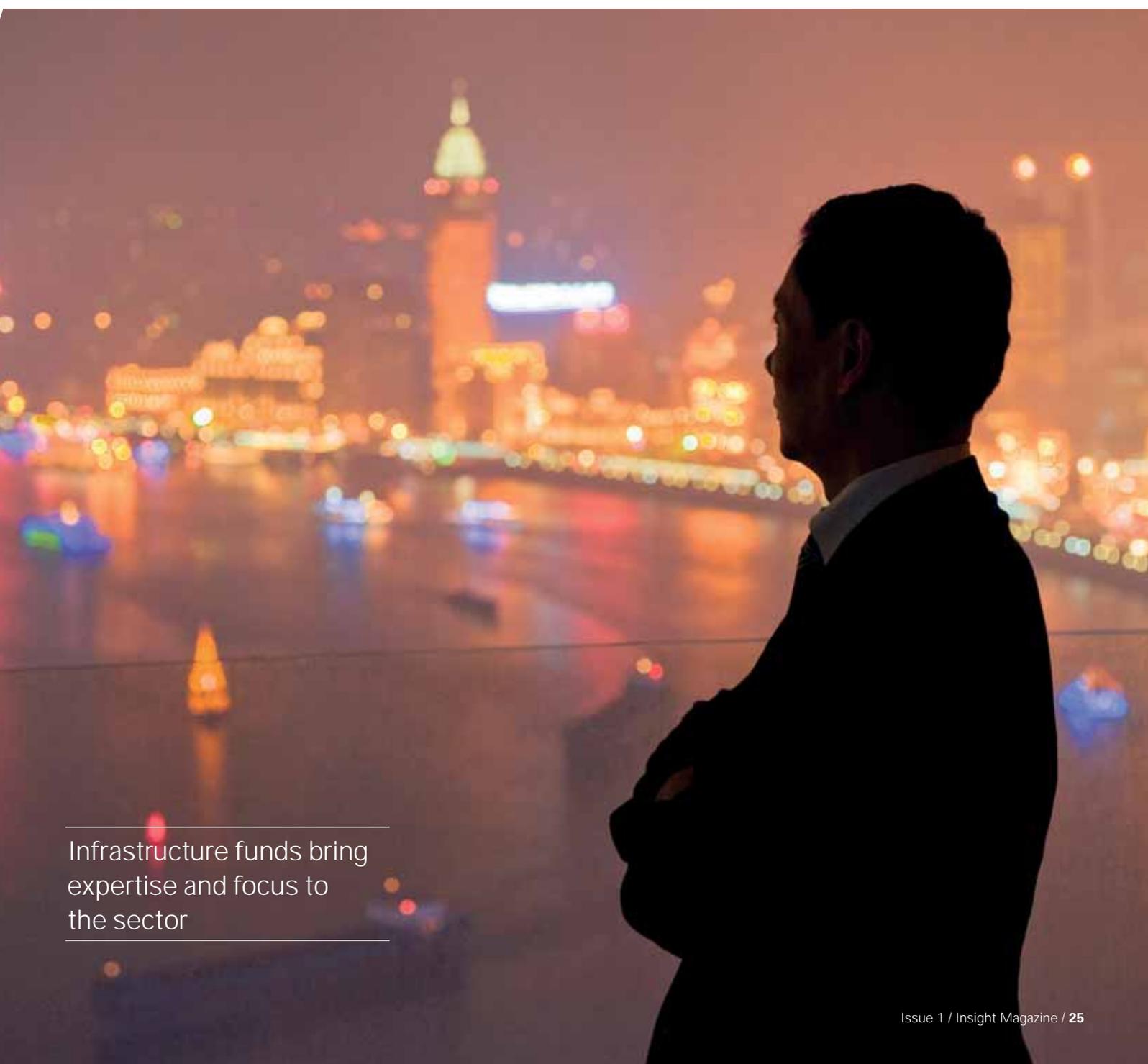
Blackstone, EQT, CVC and KKR have all launched new infrastructure funds in the past year.

This recovery of confidence should now be underpinned by a new transparency among infrastructure funds themselves. Rebuilding trust will require a more open and realistic discussion of risk and reward. Fund managers have an opportunity to explain more clearly how their investments are likely to perform in relation to the bond-equity spectrum. In the new, more sober environment following the crisis, solid, well-managed funds which are careful to communicate realistically with their investors are likely to find there is a profitable future ahead.

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Infrastructure funds bring expertise and focus to the sector

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# Europe

By Michele Connolly

For a continent that has been building infrastructure for more than 2,000 years, Europe still suffers from many of the same problems that are currently affecting markets both new and old around the world.

For one, the recent financial crisis – which has taken a toll on infrastructure globally – has had an immediate (and hopefully temporary) impact on government spending plans, reducing the scale in some cases, and eliminating some projects all together. Tied with continued turbulence in the debt markets, European infrastructure providers are – in many sectors – continuing to see lower levels of demand. This, in turn, has led to key skill sets now being exported as the construction industry looks to outside the region for new opportunities.

At the same time, budgetary issues have also resulted in a resurgence of secondary market transactions – particularly in economies like Spain and the UK – where asset sales have been used to close shortfalls on government ledgers.

Equally, the need for further investment in infrastructure has not lessened. Many governments are now starting to announce details of new revised infrastructure spending plans – albeit reprioritized and with significant emphasis on the need to access private finance in order to deliver on the plans. The question will be how quickly these projects can be brought to market, and whether the depth of the banking market will be there, particularly for countries where sovereign credit risk issues are frequently raised by credit committees.

And while Europe – or more specifically the UK – first introduced the Public Private Partnerships structure to the capital markets, the region continues to struggle to find a successor to the model in the wake of the collapse of the mono-line insurers.

However, renewed confidence in the financial markets and an overwhelming need to upgrade entire sectors of existing infrastructure – particularly in Eastern and Southern Europe – should return stability to the infrastructure market. Funders remain keen on infrastructure as an asset class – with the attraction being lending-based on a long-term, stable income stream.

To regain their competitive edge, European nations will need to find a way forward on two main priorities: bringing projects to the market faster, and addressing new areas of concern for funders – namely the stability of government finances.

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Renewed confidence in the financial markets should return stability to the infrastructure market.

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Roman road in use today  
Northumberland, UK.

# Priming the Pump: Solving the Water Challenge

By Bastien Simeon

Water is vital to human survival. But it can also be expensive. Beyond the obvious issues related to scarcity (a particular problem for governments in the Middle East, Africa and parts of Asia Pacific), water infrastructure requires high levels of capital expenditure. In fact, to meet the growing demand from an increasingly thirsty population, governments around the world will need to invest some US\$6 trillion in water infrastructure over the next 20 years.

Most countries continue to sell water at prices far below cost, creating a sizable financial shortfall for the sector and giving the erroneous impression to users that it is not a scarce and precious resource. Despite water being universally recognized as a basic human necessity, politicians will need to make painful choices to effectively liberate the sector by bringing greater financial independence to water utilities.

## Governments tapped out

Many governments have come out of the recent credit crisis with weakened balance sheets and limitations to their liquidity. So while the traditional method of addressing the cost of building water and wastewater infrastructure (i.e. collecting user fees, raising taxes or issuing bonds) may have worked well in the past, many governments are now engaging in Public Private Partnerships

(PPP) to attract private financing and help deliver water projects more efficiently. For example, concessions are being employed in parts of Western Europe (e.g. Italy and France), Morocco and China; leases are favored in Cameroon, the US, Armenia and Russia; while management contracts are popular in countries like Oman, Saudi Arabia and Algeria.

Private sector involvement will be particularly strong in areas of Southern Europe, as countries struggle to comply with the new European Union wastewater regulations. Developing nations will also see a rise in private sector funding, especially areas of the Middle East, Latin America and China. The US is another prime candidate for PPP models as cash-stripped municipalities struggle to provide a host of civic services to their citizens.

## A flood of demand

Heavy industries such as oil & gas or mining will also see an increase in water infrastructure and technology investments in an effort to make more efficient use of their current water resources and comply with stringent environmental regulations and expectations. Wastewater treatment will also be increasingly important as countries in dryer climates look to reuse as much of their available water as possible.

Regardless of the reasons for their use, PPP models have been growing in acceptance across the water industry, as demonstrated by the steady growth in the number of projects and by the diversity of new entrants into this market. As experience with PPP models and project delivery grows, there is little doubt that governments will increasingly be turning to private sector participation as a proven strategy for alleviating the need for direct capital expenditure on new facilities, while at the same time improving service provision.

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Most countries continue to sell water at prices far below cost.

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Salt evaporation ponds on Atlantic coast  
Namibia, Africa

# Advantage India: The Investment Imperative

By Manish Agarwal

The Indian tiger is on the move. Across the country, there are clear signs of growth and development. From tightly-packed roads and rails to modern office towers and multi-billion dollar business deals, it is obvious that India is making a place for itself on the world stage.

Since the start of economic reforms in the early 1990's, India has slowly but surely been picking up steam. India's economy will grow at an estimated 9 - 10 percent annually by 2015, where China – for example – is expected to settle at around 8 percent. India's population is growing, too. By 2020, she will add another 123 million people to the workforce, bringing the total population to more than 1.3 billion.

With the "license Raj" a thing of the past, India's biggest barrier to growth and investment is now her infrastructure. Roads and train systems are seriously inadequate to keep pace with growth. Power generation and distribution requires massive investments, as vast tracts of the country are added to the grid (for a more in-depth look at India's power sector, see the related story on page 43).

## Private capital welcome

Much of this investment will need to be funded by private and commercial capital. The government recently announced a doubling of the infrastructure budget to US\$1 trillion for the years 2012 through 2017. They are aggressively courting investors and reviewing policy to create a more hospitable environment for infrastructure providers. But foreign investors will still need to overcome some unique challenges when participating in the local infrastructure marketplace.

One of the most noticeable differences is the market and economic risk that Indian infrastructure projects carry, in contrast to the government's performance risk in traditional availability-type projects. With very few exceptions, feasibility of infrastructure projects in India is based on user fees and tariffs. And with no government entity available to enhance a project's overall credit rating, participants will find that much of the market risk is instead carried by the project itself. Regardless, many state governments may have sub-investment grade credit ratings and/or have exhausted their contingency liability, making market risk the preferential option in most cases.

This reliance on user fees and tariffs, combined with tight competition in many sectors, also has a direct effect on the way that projects are structured and planned. Feasibility of a project requires that the user-charges be affordable, with the resulting project structure engineered to achieve that price point. This requires innovation in project execution, leading to different risk sharing and pricing of risk. In many cases, for example, this may mean bringing project management in-house or splitting contracts between multiple vendors to achieve better pricing and feasibility.

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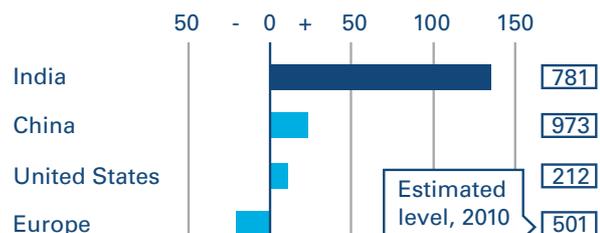
The Indian government recently announced a doubling of the infrastructure budget to US\$1 trillion for the years 2012 through 2017

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## India's population is growing

Working population, forecast increase in millions, 2010-20



Sources: Morgan Stanley, UN.



### Standardizing investment models

Foreign investors will also find that policy and regulatory maturity varies across sectors, and across states. Public Private Partnerships (PPP) models have been widely used in the road and power sectors, leading to a broad understanding and standardization of the model's application. Ports and airports have also achieved a fair degree of standardization, however regulation in these sectors is still in the process of being properly defined. But in most other sectors such as urban infrastructure, education and health, PPP models are still evolving with different states experimenting with their own variations. This has led to most investors choosing to participate in a range of sectors, effectively hedging their risk in one sector against more secure bets in others.

Levels of project preparedness also vary across the country, with direct implications for infrastructure developers. While the central government clearly recognizes the benefits of advance project preparation for attracting the required investment, some states still prefer to rush a tender to bid and let the details sort themselves out later. In most cases, this creates lag times between the initial bid and the close of financing that can span three to twelve months, or more. Build-operate-transfer (BOT) bids are generally tendered on a fixed-price

basis, any delay exposes the project to significant inflation, currency and market fluctuation risks that must be accounted for when planning an investment.

### Foreign capital starts to flow

In spite of these differences, foreign investment has been pouring in to the country's infrastructure market. Global funds including 3i Group Plc have already invested in India's ports and power plants. Macquarie Group Ltd., Australia's biggest investment bank, and State Bank of India, the nation's largest lender, said last year that they raised US\$1 billion to invest in the nation's infrastructure. A recent invitation for a billion dollar mega-expressway project has also elicited expressions of interest from nearly a dozen consortia, most having foreign investors. Even as recently as early October, big name investors such as Morgan Stanley and Standard Chartered were snapping up equity in airports and power plants from local infrastructure providers.

But India will need to focus on increasing the capacity of local service providers and contractors if they hope to achieve their 2017 infrastructure goals. A stark shortage of skills in the local infrastructure industry has led to skyrocketing demand and increased prices. With millions of potential workers, the need to provide quality training and hands-on experience will be critical to achieving a sustainable infrastructure industry.

Central government clearly recognizes the benefits of advance project preparation



Metro station  
Dehli airport, India

# The Roll-Out of Next Generation Networks

By Julian Vella

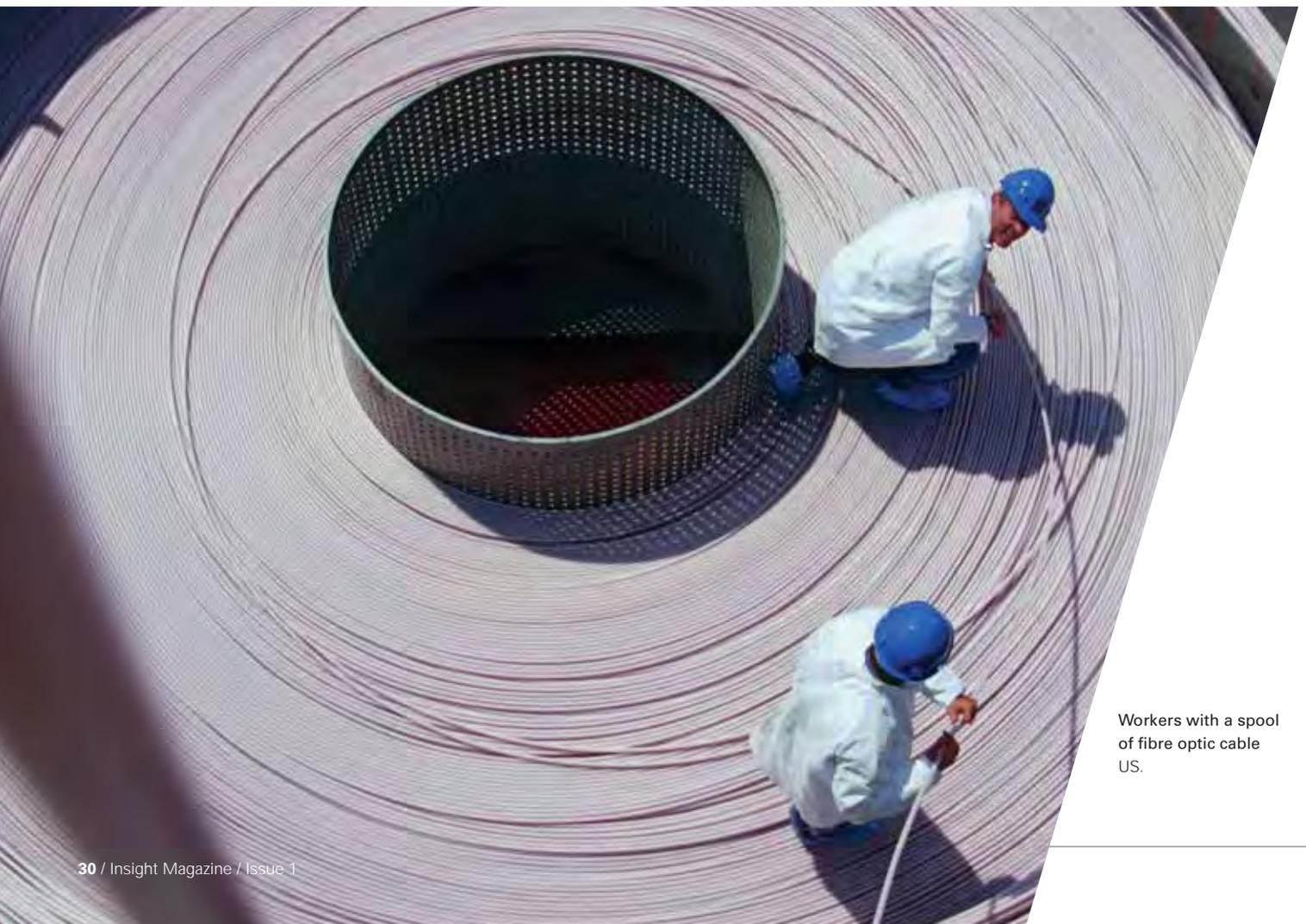
The race for broadband is in full swing. Governments around the world are waking up to the social and economic benefits that can be gained from universal internet access. And while most evidence is – currently – anecdotal, it isn't very difficult to imagine the transformative power that broadband access offers a population: x-ray films shared between a doctor in the Australian Outback and a diagnostician in New York; high quality education and training videos streamed to oil riggers in Alaska or rice farmers in Vietnam; internet-based micro-businesses sprouting up in rural areas and remote regions.

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## Why isn't every government making

For most governments, the case for universal, high speed, broadband is self-evident. Indeed, many countries are already actively competing to be amongst the first to deploy 'next generation networks', or NGNs, and thus reap the rewards that come from early adoption. Particularly in Asia and parts of Europe, plans for universal NGNs are rapidly advancing and – in many cases – well into implementation. And as the race for broadband continues, these countries will continue to distance themselves from the pack.

So why isn't every government making NGNs a top priority? In large part, governments are uncertain as to how to stimulate the market in ways that encourage private investment while not hampering competition.



Workers with a spool of fibre optic cable US.

## Governments are also trying to decide on the right mix of technology

### Government interventions

Already three main models are starting to emerge.<sup>1</sup> The first, being embraced by Australia for example, is to provide direct financial investment into the country's infrastructure network. Some US\$43 billion has been earmarked for the project, with the goal of providing reliable, high-speed access to both cities and the most remote regions of the outback.

Singapore offers a different model, where regulatory levers were used to create a separate Network Company (responsible for operating the underlying 'passive' infrastructure) and Operating Company (with responsibility for 'active' infrastructure such as switches, servers and routers). Home and business service provision was then opened up for public competition.

The third model, currently evolving in Canada, sees the government set up a competitive bid environment for rural and underserved areas, with government funds providing a substantial portion of the project costs – 50 percent in Canada's case.

Of course, geography and population density always play a part in both the economics of broadband development and choice of model, with high density

countries like Singapore (at around 7,000 inhabitants/km<sup>2</sup>) undoubtedly enjoying significant advantages over Australia and Canada (each with only 3 inhabitants/km<sup>2</sup>).

### Getting it right the first time

Governments are also trying to decide on the right mix of technology to carry their populations forward. In Australia, emphasis has been placed on fiber as being the most reliable and 'future proof' solution for the vast majority of the country, with wireless and satellite access only considered in remote situations. The Canadian program, on the other hand, is technology neutral, accepting applications from any fiber, wireless or satellite providers that can properly service the area. In this respect, it should be noted that Australia enjoys unprecedented control over the type of technology procured by virtue of their funding position.

The other big technology question is around what speed of broadband access is required for communities to realize the intrinsic benefits of the service. Again, variations in approach are evident between different countries. Singapore and South Korea, for example, aim for – and often achieve – speeds in excess of 100 Mb/s, while other countries

prefer instead to set minimum speed requirements, as is the case in Canada where projects that result in speeds of less than 1.5 Mb/s are disqualified for government funding.

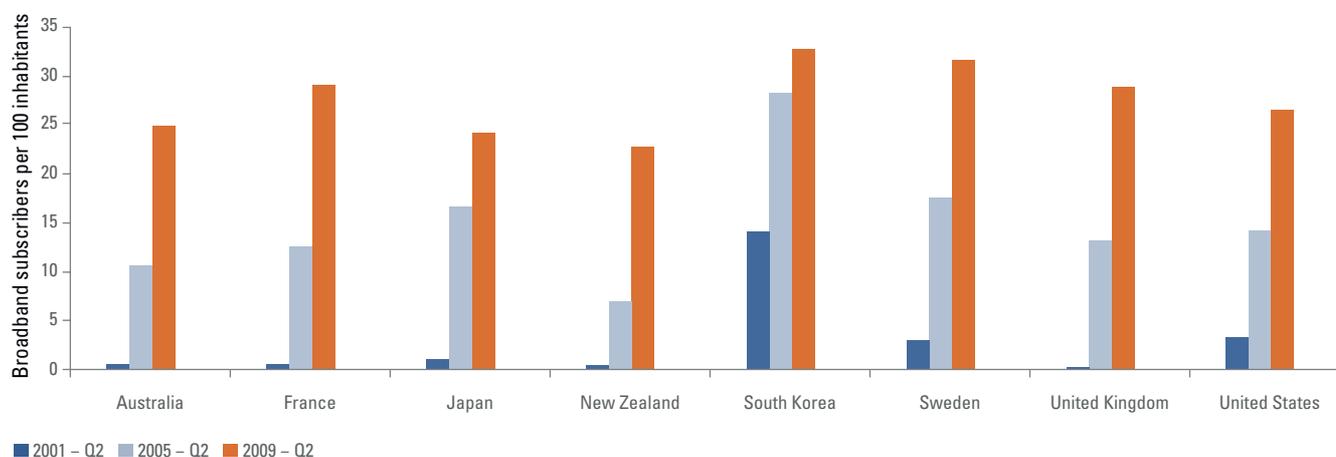
And while great expanses of the world, especially throughout Africa and Latin America, already receive rudimentary broadband access through the explosive adoption of cell phones in these regions, there is a growing consensus that higher-speed and more reliable systems must be rolled out for the population to receive many of the most valuable social and economic benefits of broadband.

### A global competition

With so much on the line in terms of social benefit and competitive advantage, governments will increasingly feel the need to intervene in their national and state broadband markets in order to both ensure a minimum standard of access is available to all citizens, and defend their competitive position in the world economy.

If recent history is any indication, we can all look forward to great leaps in broadband capacity and with it, a whole new world of life-changing applications that are simply unimaginable today.

### Broadband<sup>2</sup> (speeds in excess of 256 Kbps) subscribers per 100 inhabitants



Source: [www.oecd.org/sti/ict/broadband](http://www.oecd.org/sti/ict/broadband)

<sup>1</sup>For more information, see *Next Generation Networks*, KPMG International, 2010.

<sup>2</sup>DSL, cable, fiber and wireless connections.

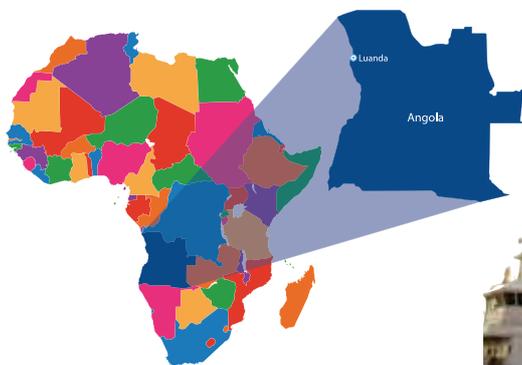
# Emerging Infrastructure Markets: Angola

By Fernando Faria

With enough natural resources to kick-start almost any economy, Angola is set to become one of the world's key emerging infrastructure markets.

Since ending a 27-year civil war in 2002, Angola's government has been focused on building a stable economic and political environment. But after such a long and violent conflict, most of the country's critical infrastructure has either been destroyed or allowed to deteriorate beyond use.

Already, there are clusters of infrastructure development sprouting up across the country. China, in particular, has been very active in designing and building infrastructure to connect the country's rich resource assets to key transport infrastructure. And with several billion barrels of oil reserves, significant diamond and iron ore deposits and vast tracts of fertile land, there is no doubt that these types of bilateral 'infrastructure-for-resources' deals will continue to play a leading role in the development of Angola's infrastructure.



Luanda harbour  
Angola, Africa.

This still leaves a considerable infrastructure gap for the government of Angola. On the one hand, the traditional bilateral agreements of the past have been limited to design and construction, leaving a sizable resource requirement for the maintenance and operation of the resulting facilities. On the other hand, much of this investment has been focused on roads, rails and ports rather than other equally critical priorities like social housing, water, power and sewage.

Angola's current government certainly recognizes the issue and seems determined to find a solution. They are actively drafting Public Private Partnerships legislation to increase transparency and governance of new funding models, and are exploring guarantee funds to deliver additional liquidity and build market confidence.

But the country still has some distance to go. Most importantly, financial markets will need to be established to support these new infrastructure models. This will require the government to take a leading role in the short-term by building relationships with international financial institutions and multinational development banks. The government will also need to continue

its positive steps towards creating a regulatory environment that supports infrastructure development.

The outlook for Angola is strong. While the country will not have been able to completely solve the infrastructure gap within the next five years, international and private investors can expect to see a more hospitable environment for infrastructure projects; functioning and transparent financial markets; enhanced national credit ratings; and a growing track record of success with smaller pilot projects.

Angola certainly has the natural resources and determination required to rebuild their economy. However, to meet their infrastructure challenge, the government will need to put the creation of a transparent and 'private sector friendly' infrastructure market at the top of their agenda.

GDP	\$107 billion (2009 est.)
Population	13,068,161 (July 2010 est.)
GDP/Capita	\$8,400 (2009 est.)
Airports (paved)	31
Railway	2,764 km
Roadway (paved)	5,349 km
Electricity Production	3.72 billion kWh (2007 est.)
Urban Population	57%





New road under construction  
UK.

# Roadwork Ahead: The Drive Towards Private Investment

By Declan McManus

Forget copper and gold. If you want to invest in a rock-solid commodity, try tarmac.

From Seattle to the Sinai and from Swindon to Singapore, roads are rapidly being built in every corner of the world. Particularly in the higher growth markets of Asia, Latin America and Africa (but also parts of the US and Europe), road construction is booming in an all-out effort to keep up with expanding populations and their voracious appetite for development.

Budgetary constraints may have – in a rather counter-intuitive way – actually helped the industry in the US by creating a market for private investment, but in most other regions (especially those that rely on government subsidies or availability payments to properly operate) the financial crisis has led to lower government tax receipts, which in turn has reduced infrastructure budgets. Rather than raising taxes to cover this shortfall (which in many states would be a political impossibility), governments have instead shelved some projects and cancelled others altogether.

But with demand for roads hitting a critical level (and the public's seemingly universal delight in deriding the condition of their local roads), governments remain under significant pressure to deliver a better and more efficient road network to their citizens.

## PPP gains traction

This has led to the increasing acceptance of Public Private Partnership (PPP) models throughout the world, particularly in South East Asia, India and South America, but also in mature markets in Europe and – on a state-by-state basis – the US. Indeed, jurisdictions with new PPP regulation for infrastructure will often find that road projects are the first real test of innovative funding techniques, as the payment mechanism provided by tolls is relatively straight-forward.

However, tight credit markets – particularly for volume risk transactions – continue to weigh on the private investment available for roads globally and – while some markets have certainly begun to stabilize – most banks are still reluctant to lend for long-term

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Governments remain under significant pressure to deliver a better and more efficient road network to their citizens.

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road infrastructure projects, requiring larger 'clubs' of lenders to close deals.

## Putting road users in the driver's seat

Looking ahead, national road pricing programs, such as the ones already in place or in development in certain parts of Europe, will likely spread throughout key regions of the world. But it is the extension of these programs to all roads and vehicles that is likely to bring about the most significant changes to road infrastructure. Achieving unprecedented insight and control over the cost of travel, choice of mode and patterns of economic development, governments and planners will increasingly be able to focus on higher-volume routes and key congestion areas.

And the future for roads? While the tolling of roads can be an emotional and politically-charged issue (particularly in places where roads have traditionally been free), the industry's current trajectory promises to deliver a system of road investment that is driven and funded by users rather than governments.

# Direct or Indirect Investment: Tax Considerations

By Naz Klendjian

Thinking of investing directly into infrastructure projects? You are not alone. Following the recent credit crisis, and the subsequent stumble of many of the infrastructure funds, more private investors are starting to consider investing directly into infrastructure projects. At the same time, investors have become more sophisticated in their approach to infrastructure and increasingly recognize the difficulty of managing tax and project risks through an indirect investment.

Infrastructure projects tend to be 'big ticket' items, and often require investors to pool together into 'clubs' in order to share risks and maximize funding. And with a wide variety of infrastructure investors in the market, these clubs may include a mixture of participants including pension funds, sovereign wealth funds, traditional infrastructure investment funds and strategic equity parties.

## Direct investment with indirect consequences

While investing directly into infrastructure may mitigate a number of tax risks for such investors, compared with an indirect investment through a structure over which there may be less transparency, it also raises a number of new tax challenges that investors should be aware of.

For one, investors participating in international consortiums will need to work closely with their partners to create a holding and funding structure that appropriately recognizes their unique 'home country' structuring needs. For example, sovereign wealth funds and certain pension funds may enjoy sovereign immunity in certain jurisdictions, or need the investment structured in such a way so as not to prejudice their sovereign immunity in other jurisdictions. This is especially so where such investors have other US investments because small structural variations on any given investment structure for these investors worldwide can have a dramatically adverse 'all or nothing' impact on the tax-free nature of certain US investments.

As with any investment involving multiple international investors/foreign assets, the location of the consortium's collective investment vehicle will also be a key consideration for investors. With the ultimate goal of ensuring 'tax neutrality' in the holding jurisdiction (given tax will typically arise at the asset level and potentially at each investors' 'home

Construction site  
London, UK.



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## We have seen an increased level of cooperation and coordination between national tax authorities over the past few years.

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country' level), all parties will need to agree on a location that offers the best outcome for each of the participants, and the consortium as a whole. This will often result in the use of vehicles in countries with stable and predictable business/legal systems and well established local workforces, which also have good tax treaty networks that help in mitigating double taxes upon repatriation of investment returns. Examples are Luxembourg, Netherlands, Malta and Mauritius.

### Closing down treaty shops

At the same time, we have seen an increased level of cooperation and coordination between national tax authorities over the past few years, which has led to more sophisticated and aggressive pursuit of those suspected to be 'treaty shopping' or utilizing other 'offshore' tax avoidance techniques. When combined with a reduction in tax revenues caused by the recent financial crisis, tax authorities are increasingly looking to tighten up their surveillance to reduce tax avoidance and target abusive practices.

Indeed, investors will want to take note of two high profile cases currently playing out in India and Australia, where tax authorities are aggressively pursuing transactions that are suspected of using multiple foreign holding companies to avoid local tax liabilities of billions of dollars. Vodafone is fighting a tax case in India over its 2007 purchase of a mobile phone business in the country, and has appealed to the Supreme Court arguing that Indian tax authorities did not have jurisdiction over the transaction which involved two non-Indian companies. Texas Pacific Group (TPG) has locked horns with the Australian tax authorities after they sought to freeze TPG's bank accounts, arguing that profit earned from the sale of an Australian retailer was Australian-sourced taxable income notwithstanding the profit was earned by a foreign company.

Developments on both cases are expected in mid-November. While the fact patterns of these cases can be distinguished from typical infrastructure investment structures, which tend to have a longer-term horizon with returns coming from cash yields (rather than short-term exit gains realized from increasing the underlying value of the business) the issues will nevertheless be of great interest to infrastructure investors worldwide.

This is because they not only involve the most fundamental (and complex) elements of any tax system (such as where profits are sourced and which country has the right to tax those profits in a cross-border deal) but because they go to the heart of an apparent dichotomy that exists in the current economic environment.

Tax revenues are the primary source of most countries' funding needs, and it is understandable that countries are seeking ways to protect what they perceive to be their funding streams. The above cases demonstrate a shift

towards tax authorities taking the offensive in terms of tax base protection when it comes to proactive pursuit of offshore transactions through aggressive (and in some cases surprising) interpretations of local anti-avoidance rules (or in India's case, through the introduction of a new general anti-avoidance rule) with the powers to override tax treaties.

### Tax authorities extend their reach

Running counter to this is the recognized need by many countries for continued foreign investment, particularly in the infrastructure sector, given the role of investment and infrastructure in the long-term growth of economies. Many countries have tax policies which on their face are designed to encourage foreign investors to invest capital in the country. However they will be acutely aware that uncertainties surrounding their local tax system and how it is applied in practice to foreign investors, particularly with respect to local anti-avoidance powers, can serve as a serious discouragement to future foreign investment, thereby stifling countries' objectives to continue to develop long-term infrastructure.

Continuing this theme, the financial crisis has also had the effect of increasing competition between countries for foreign investment, particularly in the infrastructure sector. A number of countries are looking at their foreign investment regimes, withholding tax rates and tax treaty networks to find opportunities to attract new investment, reduce complexity and cut applicable tax rates. Australia, for example, has recently introduced and updated its Managed Investment Trust rules which have the effect of slashing the withholding tax rate from 30 percent to 7.5 percent for foreign investors. This has encouraged significant foreign investment into Australian infrastructure projects going forward, which is only anticipated to increase. Other jurisdictions are looking at similar amendments to enhance their competitive position on the world investment stage.

Depending on the scope, region or structure of the investment, those considering direct investments will also need to consider a number of other variables such as underlying real estate taxes, exit strategies and related tax liabilities and the need for 'commercial substance' in the way they operate their collective investment vehicles within their investment structures.

Overall, the trend towards direct investment is ultimately a good thing for the infrastructure industry as it brings a more diverse and stable group of investors into the market, which can only enhance the strength of the industry going forward. Further, it is expected that direct investors, or 'clubs' involving a number of direct investors, will have greater transparency and choice over their investment structures and be better placed to manage tax risks emanating from the increased sophistication of tax authorities worldwide towards cross-border structures. It remains to be seen, however, what will be required to coax new investors – such as the UK pension plans – into participating directly in the industry, as well as what traditional funds might do in terms of simplifying their own investment structures so as to continue to attract indirect investment.

# Latin America

By Tim Treharne

The five years to 2008 were Latin America's best since the 1960's, with economic growth averaging 5.5 percent a year and inflation generally in single digits. After a brief downturn in 2008 and 2009, most of the forecasts suggest economic growth of over 5 percent for the region this year. When it comes to infrastructure, Latin America is a hive of intra-regional activity. Argentinean, Brazilian, Colombian and Chilean companies are feverishly bidding on – and building – their neighbors' bridges, roads, power plants and ports. At the same time, equity funds are popping up across the region to channel funds into the infrastructure market, though many focused on secondary market transactions.

Along with the increasing average size of projects, international investment is also on the rise and this will lead to an increasing sensitivity to international structuring and financing standards. However, it is worth remembering that, in the main, infrastructure projects have local currency revenues and governments are not generally willing to provide exchange-rate protection, thus creating a real risk of currency exposure for international financing.

Historically the challenge for the region has been access to credit. According to Inter-American Development Bank (IDB), total credit to the private sector

in Latin America has averaged just 31 percent of the GDP over the past four decades, less than half the figure in East Asia and in the developed world. The region must – and is – developing its domestic capital markets to access the necessary financing and, in particular, the participation of the pension funds and insurance companies – in debt as well as equity.

Brazil continues to be the economic engine of Latin America, and up until now most of the local currency long-term lending there is provided at comparatively low rates by the Brazilian Development Bank (BNDES), but it



requires significant guarantees from project developers. Recently the finance minister has announced plans to attract more private finance as the availability of capital for BNDES becomes constrained. (For more on the Brazilian power market, see over in the BRIC – Brazil on page 42).

A good portion of Latin America's infrastructure construction industry is generally world-class, with some of the larger companies becoming increasingly active in places like Portugal, Africa and the US. However, some of the smallest constructors, if they want to grow in the region, will have to actively look for allies. In some countries, a shortage of expertise in facilities management presents an opportunity for international participants to ensure that new builds go on to return value and maximize efficiency.

And while investors may be justifiably concerned about the impact of regional and national politics in certain jurisdictions, the outlook for Latin America's infrastructure market overall remains strong and stable .

## The outlook for Latin America's infrastructure market

Sao Paulo, Brazil



# Bridging the Divide: Project Finance and the Capital Markets

By Darryl Murphy

The rumors of the demise of project finance are unfounded. Having survived the global financial crisis, project finance activity has surged. In fact, the first half of 2010 saw global project finance lending volumes hit their second highest level on record.

At the same time, the demand for infrastructure is also booming. In order to deliver much of the essential energy, transportation, water and social infrastructure projects that will be required over the next decade, governments – many of whom are in a tight fiscal position following the financial crisis – will continue to look to project finance as a key enabler of their infrastructure agendas.

## Breaking the dominance of the commercial banks

However, outside of multilateral agency support, the project finance market remains dominated by commercial banks, which has severely impacted the liquidity available to the market. Indeed, most estimates put the maximum liquidity of the commercial bank market at around US\$2 billion per transaction, which – given the size and scope of many of the required projects – still leaves a significant shortfall.

Commercial banks are also wary of lending to projects that have a 'long' debt tenor of over 20 years, and – with the impact of the recently announced Basel III capital regulations still largely unassessed – there are few signs that strong liquidity will return to the market any time soon.

Not surprisingly, many project funding participants are once again looking to institutional investors – such as pension funds and insurance companies – to add much-needed liquidity to the market. On face value, this is a logical fit, as institutional investors generally seek to own a diversified portfolio of assets that match their long-term liabilities. But deeper down, there are a number of key obstacles to accessing these capital markets that must be overcome.

## Unwrapping Pandora's Box

For example, before the credit crisis, monoline insurers had dominated the market by 'wrapping' their credit rating around the lower (often BBB-/BBB) ratings of infrastructure projects to yield a product that could then be sold into the bond market. In practice, this meant that institutional investors could defer credit structuring and monitoring responsibilities to the monoline.

The credit crisis – or more accurately, the liquidity crisis in project finance – resulted in a downgrading of the monolines and an end to that model of financing. And while many attempts have been made to create 'unwrapped' bond financing solutions that appeal to the institutional investors

since then, the market continues to be impacted by two practical challenges: institutional investors (particularly in Europe) typically do not have the in-house ability to structure or analyze complex project financing; and the structure of these debt products requires significant disclosure of project information creating a higher burden of regulatory compliance.

But the most significant challenge revolves around the credit rating requirements of investors. Given the typical level of construction and delivery risk involved in infrastructure projects, many are simply unable to achieve an investment grade credit rating without significant credit enhancement. Indeed, where significant bond market liquidity only really exists for credit ratings at BBB+/A- or above, most projects funded through the monolines demonstrated an underlying rating of BBB-/BBB. And while new primary builds may be able to enhance their rating through significant risk mitigation (i.e. third party credit support from parent companies, letters of credit or surety bonding), most contractors find the level of support required to be excessively expensive, thereby limiting their use.

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## The project finance market remains

### Fortifying the ratings

One strategy that is making significant headway is to access the bond market through alternative credit enhancement structures, such as the Hadrian's Wall Capital debt product (HWC). This involves a fund providing a 'first loss' tranche of debt (as 'B Notes') that would be impacted first under any project loss scenarios. In effect, this should enhance the risk profile of the remaining debt (the 'A Notes') to an overall BBB+/A- rating that is attractive to the capital markets.

While the HWC is in its fundraising phase, it has already met with considerable interest from the market and has secured Aviva as its core investor and fund manager. It is also anticipated that the European Investment Bank will join the fund to enhance its role in unlocking alternative sources of capital for Europe's key infrastructure projects.



Construction of massive pylon foundations for Incheon Bridge Seoul, South Korea.

Given the massive infrastructure projects that are currently awaiting funding around the world, the HWC structure is likely to be one of the most realistic options for infrastructure projects to successfully access the capital markets. If successful, we may possibly see the structure replicated around the world, bringing much needed liquidity and funding to the global infrastructure market.



Jinshui Bridges,  
Tiananmen Square,  
Beijing, China.

The population  
of China.

# 1.3 billion

## China's Outbound Opportunity

By Andrew Weir

When it comes to China, people tend to talk about the really big numbers: 1.3 billion people, world's second largest economy, double digit economic growth... the list goes on. Talk of Chinese infrastructure also conjures up grand numbers and ambitious projects.

After building millions of kilometers of roads, rails and pipelines, and perfecting technologies in high speed rail, water management and power generation, many industry participants are watching to see whether China will leverage its new infrastructure experience elsewhere in the world.

### Exporting infrastructure?

Chinese infrastructure providers have certainly been busy. In Africa, for example, thousands of Chinese workers are building roads and railways to connect the vast resources of the interior to ports and pipelines, and – eventually – out for export back to China. In parts of Asia too, Chinese companies are active, in some cases bringing together Chinese financing and contractors to complete end-to-end projects in places like Indonesia.

But these anecdotal examples are not necessarily a sign of the imminent arrival of Chinese infrastructure providers on the competitive bid scene. In the main, Chinese companies are largely unaccustomed to the rigors of the tendering process,

especially in Public Private Partnership (PPP) situations. Indeed, Chinese companies are more likely to be found undertaking projects that are attached or aligned to other Chinese interests such as mining concessions or industrial facilities.

China is also becoming more adept at penning bilateral trade agreements in the developing world, a practice that often bestows 'preferred supplier' status on Chinese companies, in effect reducing the level of open competition. Situations such as the one mentioned in Indonesia – where Chinese banks and infrastructure providers seem to be teaming up to finance and deliver projects – are also very rare and tend to be more an outcome of financing terms rather than a competitive bid process.

### Technologically tied

And what of Chinese technology? Certainly, Chinese companies have mastered many of the high-tech infrastructure components that were once the closely-

guarded secrets of the developed world. Chinese high speed locomotives and rolling stock travel as fast (if not faster) than their French or Japanese competitors. Their wind farms and solar arrays are every bit as advanced as those in Germany or the US. Even new nuclear builds are quickly becoming 'old hat' for the Chinese construction industry.

But again, Chinese companies are yet to make major advances on the international market. In part, this relates to concerns in the developed world that Chinese technology may not comply with local safety and compliance standards. In reality, Chinese technology is largely developed in partnership (or joint venture) with established world leaders, and then adapted and localized for use in the Chinese market, resulting in very little actual difference between say, local high speed locomotives and those made in any other country.

All of this may soon be starting to change. There is evidence of an increasing interest from Chinese businessmen and government officials to learn more about how PPP and private investment models actually work. And just as often as Western infrastructure providers look at the enormity of the 'China Opportunity', Chinese companies are starting to look outward at the even larger opportunity presented on the global stage.

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### Creating a competitive advantage

To effectively compete in the global infrastructure market will take a number of significant changes in the way that Chinese companies approach outbound investment. For one, Chinese companies will need to properly define what competitive advantages they are able to replicate outside of China. In manpower-intensive builds, for example, China is often able to reduce cost and meet deadlines by adding more workers and more resources. But in places like the US or parts of Europe, local union practices and national immigration laws effectively eliminate the manpower advantage that China often enjoys.

Chinese infrastructure providers will also have to start thinking differently about project finance and funding if they are to seriously challenge the established market leaders. There is certainly ample opportunity. Chinese development and commercial banks tend to have deep pockets and established relationships with many of the big construction and infrastructure providers.

As with most everything in China these days, change happens quickly. Chinese infrastructure providers are starting to recognize the expanse of the opportunity that lies beyond their borders and, as the government continues its drive to create world-class companies, we can expect to see Chinese companies starting to take a bigger role in global infrastructure delivery sooner than you think.

Indeed it won't be too long before the entire concept of "Chinese outbound" folds into the world's wider definition of "Investment".

Nanpu Bridge and traffic on highway  
Shanghai, China.



# Emerging Infrastructure Markets: Peru

GDP	\$251.4 billion (2009 est.)
Population	29,907,003 (July 2010 est.)
GDP/Capita	\$8,500 (2009 est.)
Airports (paved)	58
Railway	1,989 km
Roadway (paved)	102,887 km
Electricity Production	30.5 billion kWh (2008 est.)
Urban Population	71%

By Tim Treharne

After decades of political and economic instability, Peru is roaring back onto the Latin American stage. Economic growth topped 6 percent for the first half of 2010, and similar numbers are expected for at least the next five years. At the same time, the government has set a goal of reducing poverty to 12 percent (from a current 34 percent) in the next ten years.

To maintain this level of sustained growth, Peru will need to invest heavily in infrastructure. The country currently sits at 97th place on the World Economic Forum's Infrastructure ranking, and while that is a noticeable improvement over their 110th place ranking in 2009, there is still a long way to go. Indeed, while government estimates put the infrastructure gap at US\$13.96 billion, some industry observers believe that number to be modest.

But over the past decade, Peru has been methodically preparing the groundwork to close the infrastructure gap. For one, Peru's infrastructure program is centralized under ProInversión, the state agency for the promotion of private investment. This has allowed Peru to promote a very well organized portfolio of infrastructure projects that encompass



everything from energy and port projects to jails and roads. In fact the agency recently announced that it was seeking about US\$5 billion of private investment for a priority list of projects, including US\$2.3 billion in energy generation and transmission.

Peru's infrastructure contracting system is also relatively transparent, with all contracts published online for public comment before the start of the official tender process. Thanks largely to economic reforms brought about in the 1990s, Peru also has a strong private pension market and banking system that – to date – has been the mainstay of the country's private infrastructure investment.

While this all bodes well for the future of Peru's infrastructure market, the country still has a lot to accomplish if they are to achieve the level of international investment that is required to meet their infrastructure goals. And while Peruvians will head to the polls in April 2011 to elect Congress and a new president, most observers do not believe that the results will significantly affect the country's long-term strategy for infrastructure.

Overall, Peru is well placed to achieve remarkable success in closing their infrastructure gap, with more than 50 infrastructure projects on the table for private investment, a steadily expanding economy and, hopefully, an increasingly affluent society.



# Delivering Social Infrastructure: Customizing for Success

By Adrian Wimmers

Looking for a low-risk infrastructure sector with plenty of room for investment? Try social infrastructure.

From prisons and public buildings to water and waste treatment plants, social infrastructure projects generally have low risk profiles, making them some of the most attractive investments in the industry for private capital.

However, social infrastructure projects can also be the subject of intense political debate, and each government will need to decide what scope private enterprise can play in the design, construction and operation of these projects. For example, the inclusion of custodial services into prison project contracts remains very controversial in many jurisdictions, despite the success of a similar model in the UK.

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Governments are also recognizing the ongoing maintenance and operational burden.

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ITE College West  
Choa Chu Kang, Singapore.

## Taking a long-term view

And while the trend over the past few years has been on replicating (often UK-inspired) Public Private Partnerships (PPP) models to suit local situations and needs, there is an increasing movement towards customizing unique funding models that take a longer 'whole of life cost' view towards social infrastructure projects.

This change is being driven by two interconnected issues. The most obvious is the effect of the recent credit crisis which has forced governments to find creative funding solutions for the new build costs that are required to meet society's growing needs. Governments are also recognizing the ongoing maintenance and operational burden that many of these projects represent in the long-term, which is starting to be reflected in the way that contracts are structured.

New Zealand provides an excellent example of this in practice. As a smaller economy and with just over 4.2 million citizens, New Zealand has started exploring the use of full-scale PPP models to procure larger-scale projects such as the new Wiri Prison. But for smaller projects – which are likely to form the bulk of the future

project pipeline in New Zealand – the government is open to a more flexible approach around the tender process to keep transaction costs low and market interest high, and thereby optimize value for money.

## Learning from each other

New Zealand's government has created a 'Better Business Case' approach, to help all government departments to leverage the best practices and lessons from other jurisdictions to create more effective and valuable business cases and – therefore – better social infrastructure. Consideration of a wide range of procurement options, and the most fit-for-purpose tender process, is now required for all major projects.

Similar situations are evolving in Australia and across Asia, where governments are using existing PPP models as a starting point, and then customizing their approach based on market conditions, risk profiles and policy objectives.

For social infrastructure projects, one thing is certain: governments will be expecting their next generation of social infrastructure to be designed, built and operated in a smarter way that creates better outcomes for society.

# Power in the BRIC

By Peter Kiss

## Brazil

The Brazilian electricity market is set for steady and sustainable expansion: population is set to grow by 10 percent between 2008 and 2020, and analysts expect the country to return to stronger growth levels of about five percent after 2013. But this type of expansion will push Brazil's already-stretched power network beyond capacity, turning this potential powerhouse of hydro-electric wealth into a net importer of power.

With consumption set to rise by at least 67 percent over the next ten years, the International Energy Agency believes Brazil will need to invest more than US\$10 billion a year to maintain and enhance facilities, transmission lines and distribution systems.

Along with government measures to increase the availability of electricity to the wider public, Brazil will likely also need to offer a broader variety of financial, technical, consultative and training/educational opportunities to providers in the coming decade. Industry participants are also increasingly concerned about uncertainties in both the tax and electricity regulation systems.

The country is ideal for hydroelectric generation, which currently makes up almost 85 percent of the country's total power production. However, these projects have become increasingly sensitive, bringing other sources such as gas, nuclear, wind and solar into the government's preferred energy mix, which – in turn – will drive hydroelectricity's share of the market down to about 75 percent within the next decade.

Transmission and distribution infrastructure continues to be impacted by systemic problems, although recent moves to privatize distribution have led to a noticeable reduction in both transmission losses and theft. And although market participants do not expect any further moves to privatize the state-owned power sector – dominated by Eletrobras with 40 percent of the total installed capacity – private capital will still play a major role with many projects already being led by consortiums comprising of a 51/49 ownership stake between private investors and the state, respectively.

## Russia

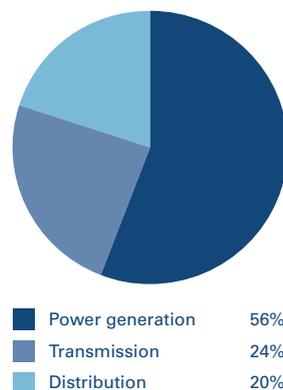
Opportunities for foreign investors are somewhat limited in the Russian power sector. Even as the aging Soviet-era infrastructure continues to decay, the government remains largely committed to 'going it alone' and remains in control of all segments, barring some thermal power plants.

Russia was hit by a double impact from the recent economic crisis: industrial activity (and therefore power consumption) stagnated, while at the same time, the price of natural gas dropped, reducing the export revenues that were once available to power generators.

However, growth levels are expected to bounce back by 2011, reaching an annual rate of more than 6.5 percent by 2013. A dramatic rise in per capita income will also drive the domestic market up, increasing overall consumption by at least 25 percent over the next ten years.

To meet this growing demand, the government has created a plan to boost total generating capacity by 60 percent, though most industry pundits believe that a more modest increase of around 20 percent is more attainable. Assuming that even this level of new generation capacity can be brought on line, transmission and distribution systems will likely be incapable of carrying the increased loadings without much needed investment.

**Russia: Investment needs**  
Total: US\$655 billion



Source: Russian Government's investment program: The General Scheme of Power

One bright area that private service providers may find lucrative is in the services sector. From heavy-current hardware and micro-electronic metering equipment to simple knowledge and education exchange, the field is vast and varied. However, there still seems to be little appreciation for the potential benefits that an inflow of private capital and experience would provide in terms of overall service efficiency and delivery.

With electricity demand set to rise from 2011, the government will soon feel the pressure – both from the public and industry – to increase the available supply of energy.

# India

Incredible India, indeed! With a population set to explode to more than 1.4 billion people by 2020 and an economy that will grow at an enviable 9 percent through the next decade, India has vast potential to lure the foreign investment, know-how and equipment required to satisfy their growing power requirements.

## India: Installed capacity (GW)

2000	108
2001	112
2002	122
2003	126
2004	131
2005	137
2006	151
<b>2015</b>	<b>204</b>
<b>2020</b>	<b>241</b>
CAGR (2000-2006)	5.71%
CAGR (2000-2020)	3.39%

Sources: KPMG, IEA, EIU

To fuel its thriving economy and increasingly urban population, India's total generating capacity will need to jump by 90 GW (to 241 GW) by 2020. Given the relative abundance of coal (albeit often of low quality), thermal power will – out of necessity – continue to be the primary source of power generation.

But there is plenty of room for other market players. Nuclear, for example is set to double in installed capacity in the next ten years. And there is a strong interest in renewables, with India already boasting the world's largest wind installation at 1,000 MW.

India's transmission and distribution sectors, however, are plagued with technical and commercial losses reaching as high as 50 percent in some states (25 percent on average). India also requires major investment into their publicly-owned utilities. However, while some losses stem from sub-standard maintenance and overloaded systems, by far the majority are the result of rampant and under-prosecuted theft.

But privatization efforts – which some industry participants credit with anecdotal reductions in theft – have made little headway in any of the sectors, with participants pointing to legal and regulatory uncertainties as well as incomplete tariff reforms as significant barriers to market entry.

There is no doubt that India has both the demand and fuel resources required to drive increased investment in the sector. It now falls on the government to create the proper regulatory and legal framework to ensure private investors can earn a fair return.

# China

Nobody doubts the impressive economic clout of China. Mixing half of the world's concrete and smelting more than a third of the global steel production, China is certainly power-hungry.

Consumption, which tripled between 2000 and 2010, is set to double again in the next decade. To keep pace, the International Energy Agency estimates that China will need to invest a whopping US\$2,765 billion into their power infrastructure by 2030. While the large majority of the additional capacity will come in the form of coal-fired plants, the country is determined to make radical advances in a number of other fields. For example, the government has issued an ambitious plan to make renewable energy account for 15 percent of the country's total energy resources by 2020.

China also boasts lower-than-average technical losses in the transmission and distribution sectors, and is expected to realize a fully integrated national electricity grid by 2020, though more investment in transmission and distribution will be required if further development of industry in the central regions is to be encouraged.

Despite the size of the market, opportunities for foreign investors and developers are not as extensive as one would think. The distribution and transmission sectors are seen as being of strategic importance and are not open to even partial foreign ownership, while the generation sector is dominated by five large, state-owned companies that account for more than 80 percent of all capacity, leaving little appetite for privatization.

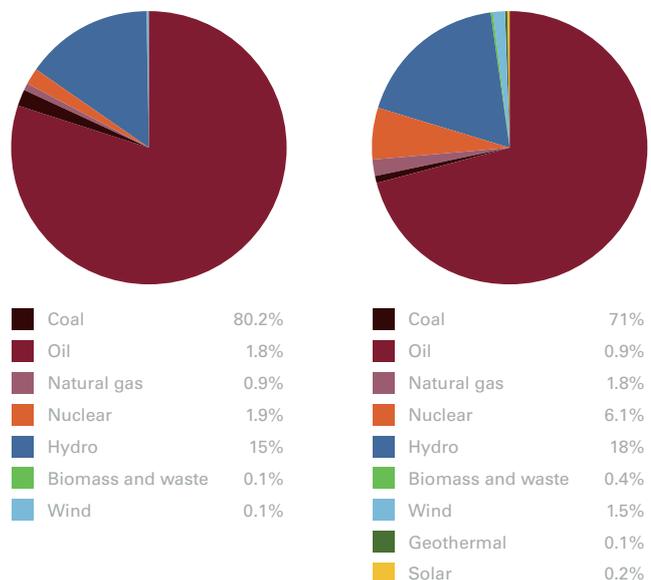
However, some opportunity does exist for foreign investors to provide services and equipment, and in many cases experience and technology – especially in the low carbon generation (renewables and nuclear) segments – to build the nation's internal capacity and knowledge base.

For foreign companies with the right know-how, technology or equipment, there is little doubt that opportunities exist in China's mounting power market. But success in this market will take time, skill, patience and a localized service model.

## China: Generation mix

2006 Total: 2,865.7 TWh

2020 Total: 6,856.7 TWh



Source: KPMG, International Energy Agency

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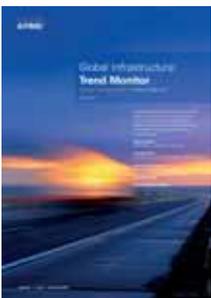


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KPMG in India and the Project Management Institute undertook this survey to decode the issues inhibiting successful project delivery. Includes the views of more than 100 top management personnel representing leading Indian companies across multiple infrastructure sectors.

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## China's Outbound Opportunity

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## Emerging Infrastructure Markets: Peru

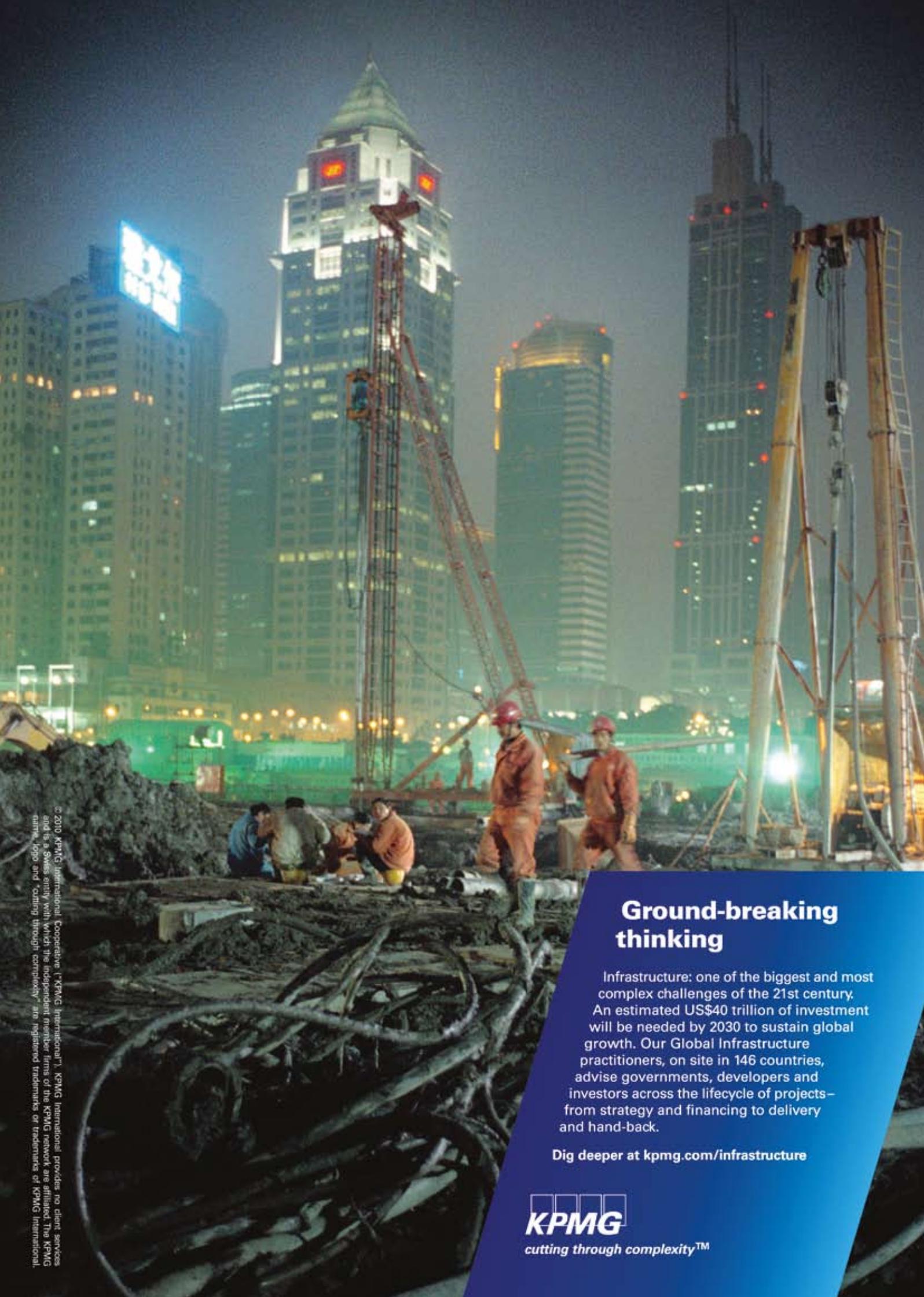
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Designed and produced by KPMG LLP (UK)'s Design Services.

Publication name: Global Infrastructure Magazine Issue 1

Publication number: RRD-222862

Publication date: November 2010

Printed on recycled material.