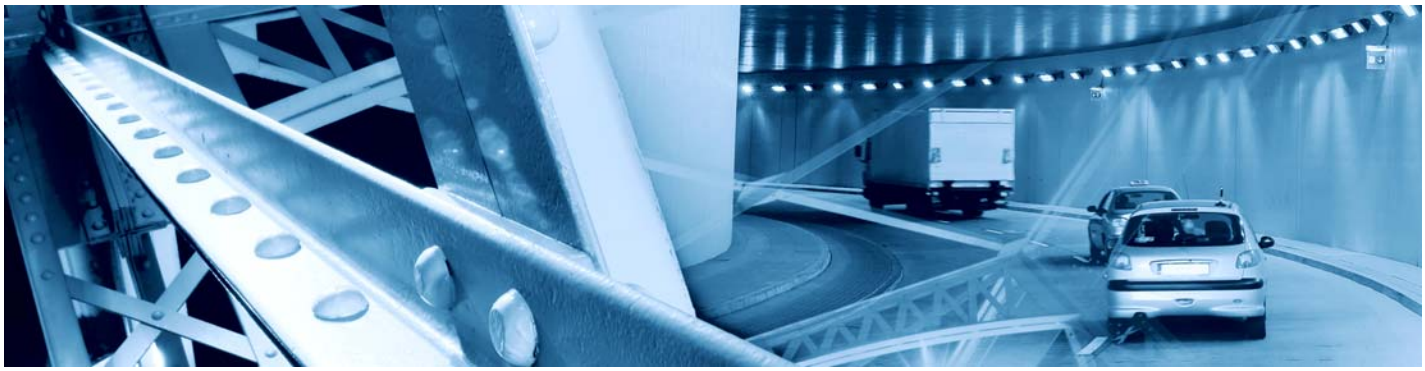
AMP Capital Investors

Quarterly Infrastructure Research Report

Edition 6 - April 2011



Overview

Welcome to the sixth edition of the AMP Capital Global Infrastructure Report, which surveys infrastructure projects announced during the period from October to December 2010.

Our survey shows that the impact of stimulus spending in developed economies continues, although fewer very large transport projects were announced. In both Europe and the US, renewable energy projects were particularly prominent. Merger and acquisition (M&A) activity was also high.

In our last edition, we criticised the poor delivery record of the Indian power generation sector, which may well be limiting the rate of economic growth in that country. The Indian government's intentions in this area were made spectacularly clear with a range of major nuclear power projects announced.

China is also pressing ahead with significant nuclear power projects, although a question mark now hangs over the rate of development of that country's high speed rail network with the jailing of the head of the rail ministry for corruption.

In our lead article, we consider the performance of the main regulatory models in developed economies. This is an area that, we believe, will become increasingly important as more countries consider privatising infrastructure assets.

We welcome your feedback. Should you have specific queries please contact Warwick Mancini (Warwick.Mancini@ampcapital.com) or Greg Maclean (Greg.Maclean@ampcapital.com).

Contacts

Client Account Management	Ph: +61 2 9257 1658 Email: internationalclientservices@amp.com.au
Global Head of Research	Greg Maclean Ph: +61 2 9257 1403 Email: greg.maclean@ampcapital.com
Australian representative	Warwick Mancini – Head of Investment Specialists, Unlisted Ph: +61 2 9257 3607 Email: warwick.mancini@ampcapital.com
US representative	Tom Majewski – Head of Infrastructure and Infrastructure Debt, Americas Ph: +1 212 223 7600 Email: thomas.majewski@ampcapital.com
UK representative	Richard Shields – Managing Director, UK and Europe Ph: +44 207 659 9279 Email: richard.shields@ampcapital.com

Regulatory approaches in developed economies

Introduction

Many developed economies have a legacy of massive public debt following the global financial crisis. In previous essays, we have suggested that increased private sector involvement in infrastructure provision could materially assist in managing this debt. The options for governments are:

- to allow some infrastructure assets to be fully privatised, i.e. sold in entirety as occurred in the United Kingdom from the late 1980s onward in the water, energy and communications sectors, or;
- 'Quasi' privatisation, in which ownership remains with the state but output is sold to the private sector, as with the recent NSW electricity sales in Australia, or;
- To improve operational efficiencies by contracting out operations of such organisations to the private sector.

If political issues make these approaches difficult, 'corporatisation' of public sector utilities by imposing private sector type governance structures may result in significant operational efficiency gains [1].

A common feature of all these approaches is the establishment of at least a degree of independence from political control. This in turn leads to an implicit requirement for some form of subsequent economic regulation.

Economic regulation must set and enforce maximum prices and minimum service standards. There is tension between these objectives. If prices are too low, the consumer may be happy in the short term but overall future investment and service delivery will suffer. Alternatively, excessive prices will drive down consumption and reduce economic activity. The success of a regulatory system can conceptually be measured by how well these two competing objectives are balanced.

The World Bank [2] estimates that about 200 new infrastructure regulators have been established around the world in the last 10 years. However, performance varied widely. The World Bank states "If there is any one lesson to be learned from the experience to date, it is that good intentions do not guarantee good outcomes. There is now considerable evidence that both consumers and investors – the two groups that were supposed to have benefited from these new regulatory systems – have often been disappointed with the performance of the regulators."

The most common problems cited by the World Bank are:

- Regulators can be unduly influenced or 'captured' by vested interest groups. The result is that regulatory decisions are unbalanced with long term detrimental impacts to the economy;
- In a number of transitional economies, regional and state governments have simply ignored regulatory decisions, subverting the workings of the regulatory process;
- A regulator may adopt an overly academic approach which bewilders consumers and investors and may be out of step with financial markets;
- Regulators may have significant deficiencies in skill sets and experience in understanding the operational and financial issues facing infrastructure businesses;
- Regulators may be inconsistent. The basis of regulatory decisions may change from one review period to the next. This is especially detrimental to investor confidence;
- The basis for reaching a regulatory decision may not be transparent, leading to concerns about the overall balance of the decision; and
- The basic design of the regulatory system may be fundamentally deficient.

It could be argued that most of these problems have been experienced in transitional economies. However, this does not mean that similar issues cannot arise in more developed economies. This paper attempts to

review the structure and performance of regulatory systems in some of the more advanced economies and, in particular, seeks to assess robustness of the systems post the global financial crisis.

For interested parties, we have included a brief historical perspective on the development of economic regulation in an appendix to this paper.

Economic infrastructure regulation models

Most economists would agree that high levels of competition, typical of a free market, will provide natural self-regulation [3]. However, high levels of competition do not exist in the case of natural monopolies. Nor is it necessarily desirable, as the cost of providing competition, in the form of parallel infrastructure for example, will outweigh any benefit to the community. The role of economic regulation of such monopolies should be to act as a proxy for a competitive market. The more closely regulation approaches this ideal, the more efficient will be the service provision [4].

This objective is more likely to be achieved in a model where independent regulation is adopted [5]. That is, the regulator should operate independently of political and big business influences. At the very least, a decision on tariffs or equity returns is far more acceptable to consumers and business if the regulator is seen to be independent.

A range of models of economic regulation have been developed around these concepts. This paper will look in detail at three widely used models. While they have similar objectives, outcomes can be significantly impacted by differences in their design and implementation.

Rate of return regulation

In this approach, a regulator allows the operator to recover operating costs and achieve a fixed rate of return on his investments. A key feature is that there are no fixed review periods but a regulatory review can be requested when there is a change of circumstance. This differentiates the approach from other common regulatory systems.

A good example is the Federal Energy Regulatory Commission (FERC) regulation of US transmission assets. FERC has largely streamlined rate setting mechanisms through its 'Attachment O' calculation. This is a forward looking cost of service rate setting mechanism which follows the following process.

- **Step 1:** Allowed return = rate base after capital expenditure (capex) adjustments * prospective weighted average cost of capital (WACC);
- **Step 2:** Revenue requirement = allowed return + forecast operating expenses + tax, depreciation and amortisation;
- **Step 3:** Calculated rate = (required revenue – revenue credits) / forecast network load

FERC determines the WACC parameters [see Box 1] and reviews inputs on capex and operating costs. It should be noted that FERC has not changed the basis of the WACC calculation since the inception of the model.

The operator takes some volume risk as the calculated required revenue is divided by the forecast network load to produce the actual rate charged per unit of energy transmitted. However, the frequency with which rates can be adjusted suggests that the forecast error is probably small.

The strengths of this approach can be seen in its simplicity, consistency and flexibility in being able to respond to changing circumstances.

Criticisms revolve around:

- A perceived lack of incentive for efficiency in either operations or in capital expenditure. Indeed, it is claimed [6] that the main incentive of the approach is for the operator to undertake inefficient capital developments that inflate the asset base but provide a poor return to the community.
- The regulatory decision is taken in reaction to a changed circumstance, for example changes in service standards or a mandated capital expenditure. The operator has to absorb the adverse impact of this changed circumstance until a decision is reached. This imposes a regulatory lag in the system which, in the past, could often be measured in years. The FERC approach attempts to minimise these impacts.

Box 1 - Weighted Average Cost of Capital

The capital assets pricing model (CAPM) is used to determine an appropriate return on equity (ROE) after tax:

ROE = risk free rate (RFR) + equity beta * market risk premium (MRP)

where:

- RFR is usually based on long-term government bond rates;
- The weighted ave**rage equity beta** of all stocks is 1. Regulated infrastructure assets are normally deemed to have an Equity Beta of between 0.60 and 0.95, representing their lower return volatility.
- MRP is usually based on the long run risk premium that equity markets have achieved over bonds.

WACC is then determined by weighting debt and equity servicing requirements, according to the formula below (or similar):

WACC = D/V* (RFR+Md) +E/V*ROE*(1-T)

where:

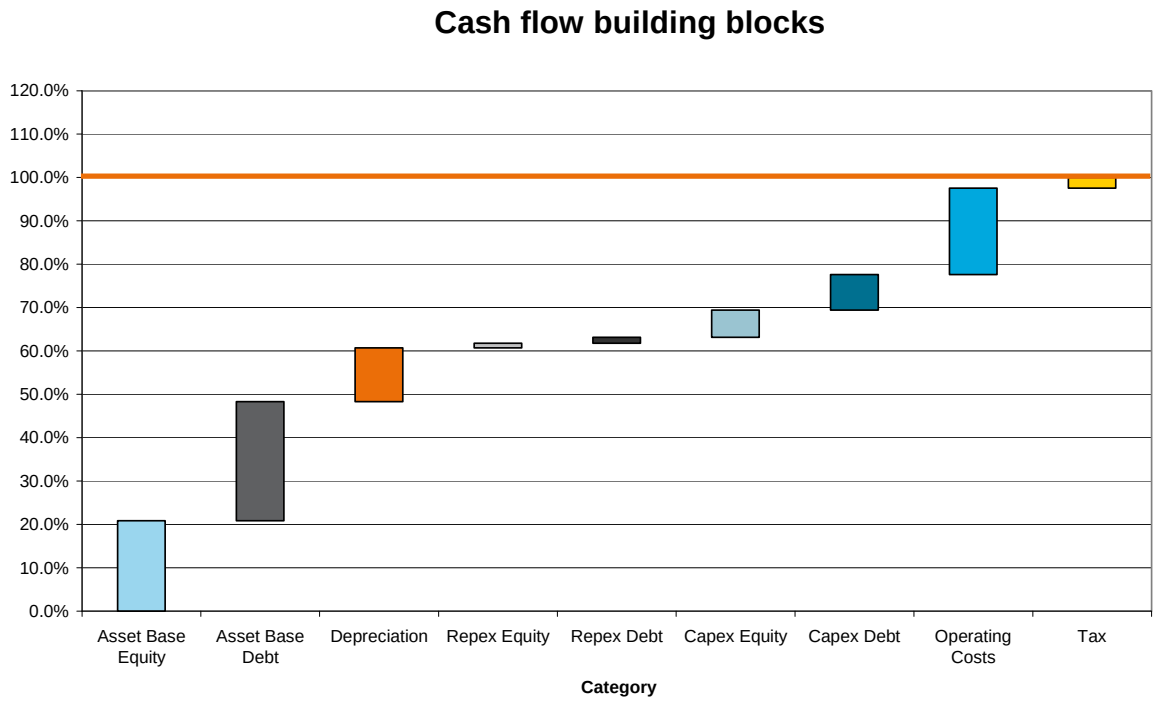
Md = forward debt spread over RFR
E = value of equity
D = value of debt
V = E + D
T = Tax rate

The underlying drivers used, including RFR, MRP, Equity Beta and Md can vary widely depending on jurisdiction.

Price cap approach

The price cap approach attempts to address the criticisms of the rate of return model. Here the operator is allowed to adjust price levels, by an inflation measure minus an efficiency factor, determined by the regulator. In the UK, where this approach arose, this is commonly represented as retail price index (RPI)-X. Significant capital development programmes could be accommodated by adding an additional capex factor to the tariff escalation, i.e. RPI - X + C.

Unlike the rate of return approach, price levels are set for a fixed period, normally every five years. The regulator first builds up an estimate of the revenues required by the business over the regulatory period. The regulator employs a building block approach as shown in the figure below.



The operator is allowed:

1. a return on the asset base. This includes returns on equity and debt;
2. a return of the asset base, i.e. depreciation;
3. efficient operating costs, usually measured against industry benchmarks;
4. efficient capital expenditure, including any expenditure required to maintain the existing asset base (repex) and expenditure required for growth (capex); and
5. tax payments.

The large capital base of economic infrastructure will normally mean that the biggest building blocks are the return on assets (debt +equity). The regulator will determine an appropriate weighted average cost of capital for this component (refer to Box 1 above).

The next largest block is usually operating costs. The regulator may measure efficiency against benchmarks, such as a comparison with peers. The asset owner benefits from any outperformance over the five year regulatory period but the efficiency gains are embedded in the next reset, i.e. they are effectively ceded to customers.

Allowed capital expenditure is split into capital for the maintenance of the business (repair capital expenditure or repex) and capital for growth (capex). An operator may only be allowed expenditure for what

the regulator deems is the most efficient use of capital. Again, the business is allowed to keep any savings from outperformance in delivering the capital programmes during the regulatory period.

With revenue requirements determined, the operator is then required to submit a tariff structure in which the net present value (NPV) of the sum of the product of the proposed prices and regulator estimated volumes is less than the NPV of the above revenue target. Price changes in individual pricing categories may also be constrained.

In this model, the operator is exposed to some volume risk, as prices, not revenues, are capped. This mimics a competitive market situation to a degree. The operator also has an incentive to maximise efficiencies as it can keep any savings it generates during a typical five year regulatory period.

The relatively long period between resets is necessary to ensure that the efficiency incentives are effective. However, this also means that the operations may be exposed to the impacts of any significant unforeseen movements in capital markets during a reset period. This brings its own problems as discussed below and marks an important distinction between the price cap approach and the rate of return approach used in the US.

Revenue cap approach

In cases where variable operating costs are low, i.e. variations in demand produce little impact on costs, e.g. for large-scale energy distribution, a revenue cap may be more appropriate than a pricing cap. The overall build up is similar to the price cap approach, but total revenues, rather than unit prices are capped.

The characteristics of the three basic regulatory approaches, described above, are summarised in the following tables. Most regulatory regimes follow one or other of these approaches or use a hybrid approach.

Other methods of infrastructure provision have also been developed, especially in Europe. The so-called French Model utilises bilateral contracts between the community and an operator to provide infrastructure services with the ultimate ownership of the assets remaining with the public sector. This approach requires no formal regulatory structure and, for this reason, is not discussed here. A summary, however, is included in Appendix 2.

TABLE 1 FORMULAS FOR PRICE BASKET, REVENUE, AND RATE-OF-RETURN CAPS

Method	Formula
Price basket cap	Prices x quantity weights (set by regulator) < cap
Revenue cap	Revenues < actual output x price weights (set by regulator)
Rate-of-return cap	Proposed tariff x predicted output < predicted costs + fair profit

TABLE 2 KEY FEATURES OF PRICE BASKET, REVENUE, AND RATE-OF-RETURN CAPS

Feature	Price basket cap	Revenue cap	Rate-of-return cap
Constraint set by cap	Weighted average of prices cannot exceed cap	Revenues cannot exceed limit (related to output) set by cap	Tariff cannot predict a rate of return above regulated level
Coverage	Specified prices (line rentals, domestic calls)	Specified types of sales (such as to captive small consumers)	Regulated business's predicted revenues
Implementation requirement	A list of prices	Output measures	Tariffs that give revenue predictions
Weights on quantities	Set by regulator	Actual quantities	Predicted quantities
Price weights in cap	None explicit	Set by regulator	From tariff
Constraint on cross-subsidy	Subsidiary cap required	Separate constraint required	Regulator could disallow tariff
Opportunity for manipulation	Very small	Some (likely to be small in practice)	Some (likely to be small in practice)
Cost pass-through terms	Might be included in cap (difficult)	Simple to include in cap	Tariff might contain escalation clause
Correction factor	Not required	Required	Not required
Advantage	Simple to define and monitor	Allows constraint to respond to actual output and pass-through costs	Investors face lower risk, reducing cost of capital
Limitation	Needs a full list of prices	Needs homogeneous output measures (revenues must be < output x weight)	Needs predictions of revenues and costs for each new set of tariffs
Example	British Telecom	British Gas	U.S. utilities

Source: Body of Knowledge on Infrastructure Regulation

How well do regulation models work?

In trying to answer this question it should be noted that the way a regulatory system is administered may be more important in determining outcomes than the design of the regulatory model. The ideal of an independent operator is unlikely to be met in practice; and external factors, especially political interference, may impact on the implementation.

The following comments relate to the experience of regulation in a number of developed economies which are considered leaders in the development of regulatory systems.

United Kingdom

The design of the current regulatory system in the United Kingdom, has been both praised and criticised in almost equal measure. UK regulators would probably suggest this means they have got the balance right and point to the fact that the UK model has been adopted in many transitional economies.

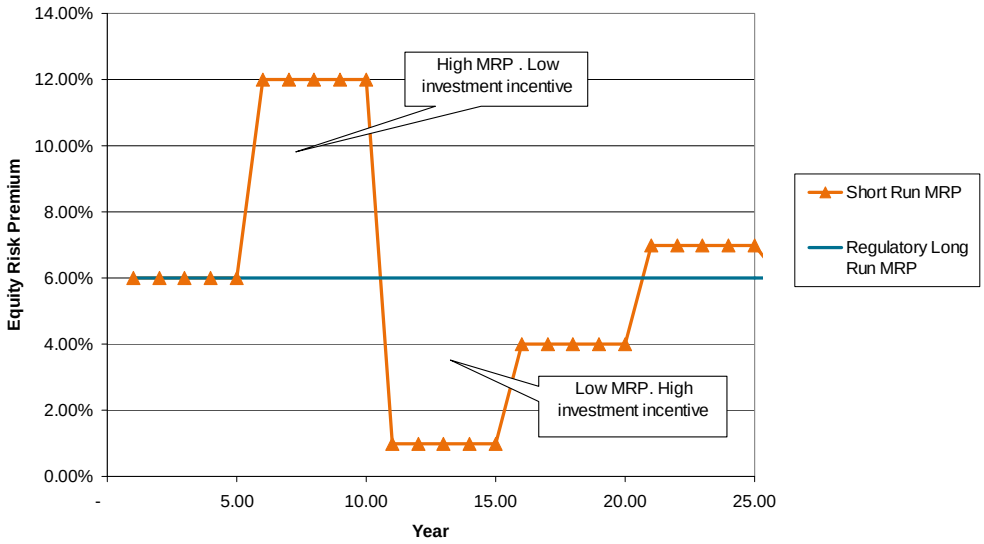
Investors may not always agree. After more than 20 years of operations, significant shortcomings in both design and implementation are apparent. The major design issues are summarised below.

- Investment return criteria on the entire regulated asset base are normally reset every five years. Therefore, a long-term investor has no certainty that returns can be maintained beyond a five-year

horizon. There has been a recent move towards lengthening the reset periods in the UK but this brings its own problems.

- There is a logical inconsistency in the treatment of debt and equity in the WACC determination. A forward looking WACC is clearly required. Debt margins are, indeed, forward looking and relatively easy to estimate. However, equity margins are usually very volatile and are much more difficult to estimate on a forward basis, especially for five years. Regulators, therefore, usually adopt an historical market risk premium (MRP). MRPs can be quite volatile, and the MRP selected by the regulator may bear little relationship to the actual MRP at the time of a capital raising.

Figure 2: Investment incentive



- A problem occurs in a depressed market as we are now experiencing post the global financial crisis. MRPs are currently substantially higher than long-term averages. This means companies may find it difficult to raise development capital from the markets at the rates allowed by the regulator, just when such developments could provide substantial economic stimulus.
- There is a legal requirement for assets to maintain investment grade status. However, the requirements of debt providers are not explicitly recognised in setting the revenue requirements. Required debt coverage ratios may vary widely and this becomes an issue during periods of low liquidity in debt markets when coverage ratios tighten. In practice, regulated companies have successfully been able to roll over their debt, so this has not been a significant problem.
- The UK model imposes a high degree of intrusive bureaucracy on the cost of doing business. It is unclear whether any efficiency gains from this form of heavy handed regulation outweigh the cost on implementation. The new conservative government has recognised this issue and is working to 'right-size' regulation.

Implementation issues revolve mainly around the continued uncertainty in application and accusations that regulators act opportunistically. For example:

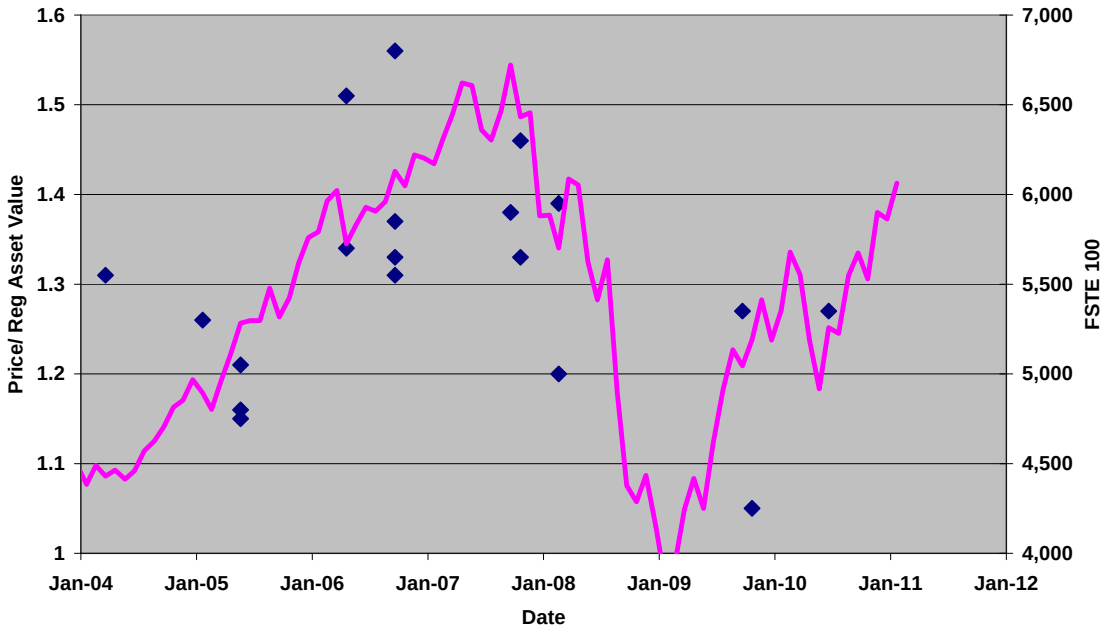
- While the methodology of the rate resetting mechanism is clear [7], the allowed rates of return have gradually been tightening since the beginning. Post the global financial crisis there is evidence that regulators are beginning to understand the issues of attracting capital in a global financial market. For example, the UK Office of Gas and Electricity Management (Ofgem) offers energy networks the prospect of increased returns derived from superior performance. The revised system is called RIIO, return = incentives + investment + outputs and focuses particularly on rewarding positive outcomes.

- In the recent forced divestment by BAA of Gatwick Airport, the Competition Commission used a market risk premium based on the geometric mean of historical data, in determining the impact on BAA, where normal practice had been to use an arithmetic mean. The Competition Commission's action produced an estimate significantly lower than an arithmetic mean of the same data [8], thereby significantly understating the impact on BAA.

In response to these criticisms, UK regulators may point out that the object of regulation is to try to achieve a balance between consumer protection and sustainability of investment in the industry by mimicking the outcomes of a competitive market. That is, a competitive market offers no guarantees to any party or protection from poor investment decisions.

If financial markets thought that returns were inadequate, investment would dry up. An indication of the attractiveness of the sector to capital can be gauged by comparing sales transaction multiples. The following figure shows the results of 20 sales involving UK regulated assets since 2004. Also shown over the same period is the movement of UK equities as exemplified by the movements in the FTSE 100, indexed to a constant 2004 GDP.

UK Regulated Assets Transaction Pricing
(Source: Price Waterhouse Coopers)



Over time, we would expect that early, easy to obtain, efficiency gains would be largely exhausted. This should lead to a contraction in multiples. As measured by the ratio of price to regulated asset value, the most recent prices do, indeed, tend to be somewhat lower than those previously achieved (refer above figure). However, relative to the levels of the financial market, the achieved multiples do not appear to have deteriorated. This suggests that UK regulated assets have maintained their same relative attractiveness to investors since, at least, 2004 – or perhaps that investors understand that regulators ultimately have to be able to attract capital to the industries they regulate.

United States

A rate of return type of regulatory model is usually adopted in the US. Investment opportunities are largely limited to energy transmission and distribution and some privately water utilities. Regulatory jurisdiction depends on the physical structure of the assets. For example, the transmission component of an electricity

utility's business, which may cross state boundaries, is regulated by the Federal Energy Regulatory Commission (FERC) whose approach is described above.

Distribution system components of the same utility are usually regulated at the state level by a state public commission. Unfortunately, the processes adopted by the various state regulatory commissions vary greatly between jurisdictions and are seldom as simple or transparent as FERC's. This means that the regulatory risk varies may vary greatly between utilities depending on their location and mix of assets.

Normally a regulatory review will be initiated by a significant change in economic circumstances. Regulated utilities earnings are based on a formal agreement struck with regulators, commonly via a General Rate Case (GRC).

Unlike the UK, oversight of this process depends largely on the courts. Court actions are time consuming, costly and confrontational. Outcomes are uncertain and interpretations may vary significantly from state to state. However, over many years, a large volume of case history has been built up resulting in some degree of consistency within a given jurisdiction.

Court challenges by vested interest groups have become de rigueur and may impose a further delay in the implementation of a rate decision, exacerbating the impacts of the regulatory lag (discussed above) on the operator. This means operators have to weigh up the potential for litigation to significantly delay a review outcome before they lodge a rate case. As a consequence, there are many examples of companies going as long as 20 years between rate cases. However, a study by Barclay's Capital [9] suggests that a strategy of frequent reviews generally produces better outcomes for the operator, in aggregate, than a strategy of holding back.

The main conceptual criticism of the rate of return approach is the apparent lack of efficiency incentives [6]. However, in practice there is no indication that US transmission and distribution assets are operated less efficiently than those in other countries [10]. The threat of litigation, especially when coupled with its potential to delay rates increases imposes an effective incentive to operate efficiently, i.e. demonstrably efficient operations are the best defence against litigation.

On the implementation side, US regulators appear far less likely to tinker with return criteria than their UK counter parties, possibly out of litigation concerns. This in turn provides investors with a higher degree of confidence.

On the negative side, the evidence for the politicisation of some state regulatory bodies is unequivocal. This is reflected in the strong regional bias in the market capitalisations of US utilities, as shown in the following table.

Relative Price-Book Valuation of Electric Utilities by Region
(1986-Current, weekly)

Region	Price/Book Ratio	Relative P/B Value
Southeast	1.67x	12.1%
Mid-Atlantic	1.68x	11.8%
Midwest	1.67x	11.5%
Plains	1.51x	2.7%
West	1.50x	1.2%
New England	1.33x	-10.3%
Southwest	1.06x	-29.1%

Source: FactSet, Barclays Capital.

Caveat emptor.

Australia

While the structure of Australian regulation tends to follow the UK model, industry structures are markedly different. The need for economic regulation arose as part of a reform program in the 1990s where much attention was focused on how to achieve the maximum return to the community from infrastructure assets, irrespective of asset ownership. Taking a lead from the deregulation of US airlines in the 1960s, the major focus of the reform program was on providing access to infrastructure by third parties. The lack of a broad privatisation program and opening access to competitors has meant that far fewer sectors have required full economic regulation than the UK.

The electricity transmission and distribution (T&D) sector offers investors the greatest opportunity to gain exposure to Australian regulated assets. This sector is currently dominated by regulated public corporations with the private sector owning less than 20% of the combined regulated asset base [11].

Looking forward, the T&D sector is facing massive capital expansion over the next five years with predicted expansions of the regulated asset base (RAB) ranging from 60% to more than 100% [11]. This has been brought on by a combination of:

- growth in peak demand;
- restructuring of the generator base including the integration of higher levels of renewable generation; and
- higher performance standards.

This capital program, coupled with changes in the electricity generation mix, will lead to large increases in electricity charges. Therefore the potential for significant public backlash is very real.

This capital program highlights a further deficiency of the design of the UK style regulatory model. The regulator makes no distinction between yield, as manifest by dividends, and growth as manifest by increases in the regulated asset base in determining the allowed return on assets. That is, the regulator effectively considers that the risks associated with project development are the same as the risks associated with ongoing day-to-day management of the existing asset base. When the capital programs in any reset period represent a relatively small fraction of the regulated asset base, this is probably not too much of a problem, but when development targets reach 100% of the RAB over a five year period, the issue becomes much more serious.

We would argue that the regulator should recognise the higher risk associated with asset developments compared with business as usual risks in its determination of WACC. This should be manifest as an increase in the allowable equity beta used in the WACC determination. This has not been the case.

It is likely that the private sector operators regulated T&D assets will have to access equity markets to fund the development program. The current regulated ROE criteria, set by historical precedents, are well short of the market. To raise the required capital, companies may have to offer additional shares at a discount, forcing a dilution in existing shareholdings.

The ownership structure of the sector imposes a further difficulty in determining the effectiveness of economic regulation in Australia. State governments, which own the majority of the regulated assets, receive political capital from spending on infrastructure. This means that a state government is more likely to spend, irrespective of economic returns, than the private sector. Given the relative sizes of public and private ownership in this sector, the impact of any pure financial market signals on regulatory decisions may be significantly diluted.

Other European experience

In general, economic regulation of infrastructure is less common in continental Europe where infrastructure is either still largely run on a traditional public sector model or where the concession approach has been adopted (refer to Appendix 2).

In those cases where economic regulation is adopted, aspects of both rate of return and pricing cap models can be seen. European models tend also to be characterised by a greater readiness to share risks than either the US or UK.

Italy [12], for example, has adopted what could be considered a hybrid model of rate of return and price basket caps in its regulation of its countrywide gas distribution network. A four-year fixed term has been adopted, but:

- Premiums are allowed on new strategic investments and these extra returns are protected for up to 15 years; and
- Efficiency gains are shared 50/50.

This means that returns on legacy assets are secured for a relatively long period, which largely overcomes the main issues regarding the UK price cap and revenue cap models.

Is there a best system?

It is clear that there is not one single ideal or perfect model of economic regulation of infrastructure assets. If we rephrase the question to "What is the best regulatory system that could be employed by a truly independent regulator?", then the UK model of price cap regulation and its subsequent modification in Australia, may have traded off too much in terms of overall 'fairness' in its efforts to promote operational efficiency. The forthcoming massive capital expansion of the Australian T&D sector will provide a stern test for this model which we will watch with interest.

The rate of return regulation model, as practiced in the US, has evolved in a strongly confrontational environment over many years. The main shortcomings are:

- There is a wide variation in interpretation between jurisdictions.
- A continued reliance on court processes means that an operator can only completely protect his legacy returns on assets by not seeking a GRC. This clearly undesirable.
- There are inherent regulatory lag impacts.
- The apparent lack of efficiency incentives – the model allows the regulator to review operating budgets, so efficiency targets could be imposed in principle, removing one of the main objections to the model.

Clearly, some form of appeal process that did not rely on the courts would go a long way to providing a higher degree of consistency. A body like the Australian Productivity Commission could fill this role.

The regulatory lag problem appears to be a fundamental design issue, but, as FERC has demonstrated, this can be largely overcome by streamlining the processes. On the positive side, the model is flexible, as a rate case is only initiated on an as-needs basis.

In answer to our question, the FERC style approach scores highly in terms of fairness, transparency and predictability and it appears to be the best current manifestation of a regulatory model.

It is also equally clear that the design of the system matters less than how it is implemented. In this regard, it would be hard to argue that the ideal of an independent regulator has been reliably achieved even in advanced economies.

Any regulatory system will have to operate within a political system. Politicians determine the framework for the regulatory system and are driven by particular historic circumstances and/or political ideologies. This in turn will drive how a system is implemented.

From an investor's perspective, this survey should confirm that successful investing in regulated infrastructure anywhere should carefully consider the regulatory risk. Managing this risk is an essential part of the skill set of regulated companies' management. An investor may do well to seek the advice of specialist asset managers and advisers.

References:

1. NSW Treasury, *Policy Framework Government Trading Enterprises – A Report by the Steering Committee on Government Trading Enterprises*, 15 September 1988
2. World Bank: *Handbook for Evaluating Infrastructure Regulatory Systems*
3. Adam Smith; the Wealth of Nations
4. Centre on Regulation and Competition Working Paper Series Paper No. 6: *Economic Regulation: A Preliminary Literature Review and Summary of Research Questions Arising*
5. IATA Economic Briefings No 6: *Economic Regulation*
6. David M Newbery, *Rate-of-return regulation versus price regulation for public utilities*
7. Ofgem: GDPCR 2008 – 2013 *The Allowed Cost Of Capital,* "Cost Of Equity Section Update"
8. Competition Commission, *BAA airports market investigation – A report on the supply of airport services by BAA in the UK*
9. Barclays Capital, *Power & Utilities 101*, June 2010
10. Ernst R. Berndt, Roy Epstein, Michael J. Doane, *System Average Rates and Management Efficiency: A Statistical Benchmark Study of U.S. Investor-Owned Electric Utilities*, 2008
11. Australian Energy Regulator
12. ENI Snam Rete *Gas Regulatory Framework*

Appendix 1: An historical perspective of economic regulation

From the beginning of industrialisation, most of what we now consider as economic infrastructure was developed, owned and operated by the private sector. Examples include toll roads, canals, railways, and early electricity generation and distribution networks. Some of the surviving water companies in the United Kingdom even pre-date industrialisation and were established under charter from King Charles I.

Subsequently, governments realised that many of the services provided were essential to the economic health of the country. This, in turn, led to a view that such services should be either economically regulated or put under government control. In most developed economies, ownership and operation of infrastructure assets gradually came under public sector control but a regulatory path was often followed in the United States.

An early example poor regulatory regime can be seen in the story of US railways. Price cap regulation was introduced in the 1890s and direct control passed to the United States Railway Administration (USRA) in 1917, passing back to the private sector in 1920. Continuing price controls, in a period of high inflation, scared investment capital from the sector.

This period saw a rapid decline in the fortunes of the US railways. By setting prices insufficient to cover the supplier's costs and allow a reasonable return on the capital invested, the regulator was covertly confiscating the assets belonging to the company's shareholders. The protection of private property is expressly guaranteed by the US constitution and the extent of regulatory power was tested in the Supreme Court in many actions. The glacial progress of many of these actions meant that by 1939, one third of US railway companies were in receivership.

In the mid-1960s, experience with the deregulation of the US airline industry brought the realisation that opening infrastructure access (i.e. airports) to third parties would ensure that services would be priced competitively. That is, in many cases, there was no need for economic regulation provided even handed access to the assets was provided to competitors.

In the UK, the pendulum in the public private ownership debate swung back decisively towards the private sector starting with the privatisation of British Telecom (BT) in 1984. This was the first in a program of privatisations in the UK which saw the ownership of water, energy transmission, communications and ports change from public to private ownership. The UK approach to designing regulatory systems has subsequently been adopted by many emerging economies.

In Australia, opening access to infrastructure assets was a major thrust for the large-scale re-organisation of Australian infrastructure assets in the 1990s. The assets largely remain in public ownership, but operate under a corporatised model. Regulation is most concerned with the nature of the access arrangements, including fair rentals for access by competitors, rather than setting the economic parameters of the overall operation. Where full economic regulation is required, a regulatory model based largely on UK precedents was adopted.

Appendix 2: An alternative approach – the French Model

In the so-called French Model, ownership of assets is retained by the community. However, operations may be contracted out to the private sector. This can be done through a lease contract (affermage) in which the private sector operator leases the assets and operates them at its own risk. Tariffs, including escalation provisions, are set for the contract period. The operator must achieve specified performance outcomes but how it achieves these targets is up to it. The term is typically 10 to 15 years.

In a further development of this approach, the private sector operator may also be responsible for the ongoing financing and development of the assets under a concession contract. Concession contracts tend to have a duration in the range of 20 to 30 years, after which the assets are returned to the municipality or state. At this time, the operator is compensated for any non-amortised capital it has spent. A greenfield single asset version of this approach is the build own operate transfer contract (BOOT).

These forms of contract have been used to cover a wide variety of infrastructure provision including water and wastewater services, toll roads and telecommunications

The beauty of this approach is that that it requires no implicit economic regulation. Operating standards, maximum tariffs and returns on investments are embodied in the bilateral contracts between municipality and service provider. Competition is ensured by offering the contracts in open tenders.

Critics of the concession approach cite the high potential for capture of the contracting body by the service provider. The long contract periods mean that the contractor acquires a much more detailed knowledge of the assets than the municipality over time. That is, there is potential for information asymmetry. While BOOT, or single asset contracts, are relatively simple to hand over on completion of the contract period, in large and diverse systems capital development will usually be ongoing throughout the contract term. The result is that concessionaire's investment will seldom be fully amortised by the end of the contract period. This means that the municipality can only change operators at the end of the contract after making significant compensation payments. It is often easier to just roll the contract over. That is, operators are seldom changed once embedded in a network.

Additionally, given that most knowledge resides with the operators, the development of an independent consultancy sector, may be stifled. This means that the municipality may not be able to effectively evaluate the performance of their operator, including a critical analysis of its recommendations for capital expenditure.

Despite these concerns, pricing comparisons between France and other developed economies have failed to provide evidence of inefficient operation of the concession system.

In our opinion, the major valid criticism of the concession approach is the lack of transparency regarding investment decisions brought on by the concentration of the skills within a small number of competing groups. That is, the only people who could offer an informed view of investment plans for a municipality are the current operator's competitors.

Recently, there has been some reaction against the concession model. For example, the City of Paris, under its socialist mayor has recently (2010) taken over control of operations of its water supply from Veolia and Lyonnaise Des Eaux. This may be motivated more by politics than any shortcomings in the performance of the concessionaires.

Critics of the UK regulatory process, including Professor Dieter Helm at the University of Cambridge[1], recommend the wholesale adoption of the concession model for all UK infrastructure. Indeed, the recent developments in UK public private partnerships (PPPs) have much in common with the French affermage and concession approach and are being increasingly used for the development of new stand alone assets.

1. Dieter Helm, *Ownership, Utility Regulation and Financial Structures: An Emerging Model,* 2006

Infrastructure update

How to read this section

In this section, we have summarised recent infrastructure activity by region and sector. The geographic spread principally considers developed (OECD) and the main emerging economies.

The four regions included are:

- Europe;
- North America, principally the US and Canada;
- North Asia, principally China and India; and
- Australasia, Australia and New Zealand.

The sectors are summarised in the following table.

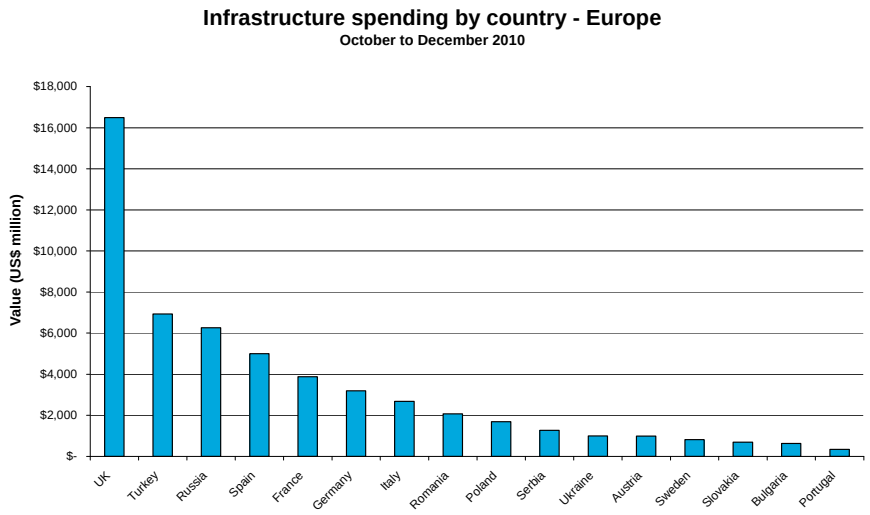
Sector	Description
Power	New generation assets, apart from renewable energy.
Transmission & Distribution	Energy distribution, principally electricity and natural gas.
Transport	All transport infrastructure, including air and sea ports, railways and road developments.
Water & Sewage	Assets associated with management of the water cycle from collection, distribution, treatment and disposal. Irrigation projects are also included.
Telecommunications	Communications assets.
Social Infrastructure	Includes health, education and justice assets.
Storage	Principally energy storage projects, including liquid hydrocarbons, natural gas and carbon sequestration. Additionally, pipelines built for carbon sequestration will be included in this sector.
Renewables	Renewable generation projects of all types.

To assist in analysing this information, the nature of the funding has been further broken down, as follows.

- **Investment –** This refers to situations where a traditional funding model is used for both new stand-alone developments and the development of an existing asset base. The latter represents 'business as usual' activity in either replacing or growing existing infrastructure assets. In general, infrastructure operators have demonstrated that they can fund the equity requirements of all but the largest of expansion projects from cash flows.
- **Public Private Partnerships (PPPs) –** This covers all types of private sector provision of infrastructure including build, own, operate, transfer (BOOT) schemes, concessions and design, build and finance. From this edition on, projects involving privatised utilities, such as UK water companies, will be classified as PPPs as these represent expenditure which does not appear on the government's balance sheets.
- **M&A activity –** While this does not represent bricks and mortar construction activity, it is a useful indicator of the attractiveness of the sector to investors overall.
- **Private equity (PE) –**This will generally relate to private investment in infrastructure assets.

This summary was developed from publically available sources and while due care has been exercised in its preparation, AMP Capital offers no warranties as to its completeness or accuracy.

European infrastructure



After a bumper performance in the previous period, aided by massive transport projects, activity slowed down somewhat towards the end of 2010, with a total of US$57.6 billion of committed spending identified in the three months to December 2010.

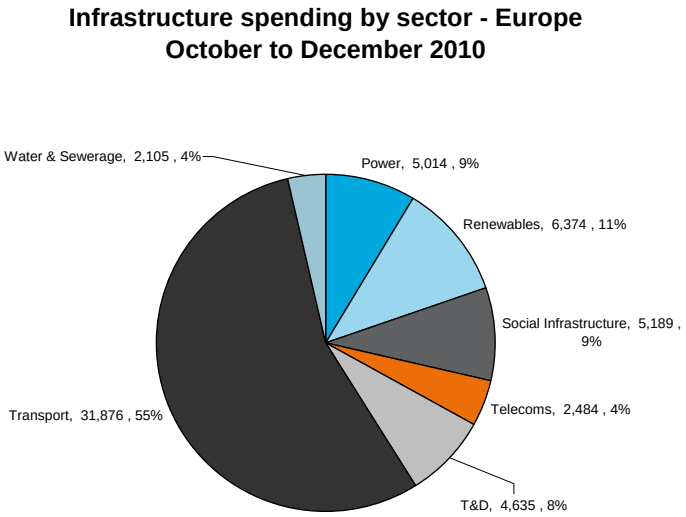
The UK was the stand out with significant spending across all sectors and over US$16 billion committed to new investment.

Turkey came in second on the back of a US$6.4 billion road concession contract.

The large economies of Russia, Germany, France, Italy and Spain were more subdued.

M&A activity was also strong with US$34 billion of activity across most sectors. The largest of these was US$11 billion the sale of Vodafone's stake in the French mobile phone group SFR for £7 billion to Vivendi S.A., which owned the remaining shares in SFR.

European infrastructure investment by sector – October to December 2010



The transport sector was the largest sector, although its share dropped significantly from 64% in the previous period of expenditure to 55%.

Of the other sectors, renewable energy saw the largest boost, up by almost US$4 billion as governments sought to fill renewable quotas.

Major projects are summarised below by sub sector.

Roads

Road development was significant but with a large concession contract in Turkey being the most prominent news. The main projects are described in the table below.

Description	Amount (millions)
A 421 km highway from Gebze to Izmir in Turkey will commence following the completion of a concession agreement. The build-operate-transfer project will be carried out by five Turkish contractors – Nurol, Özaltin, Makyol, Yüksel and Göçay, plus Italy-based Astaldi. Work is scheduled to commence in 2011, and is expected to be completed within seven years.	US$6,540
Mostotrest will build the second and third sections of Kurortnyi Avenue in Sochi, Russia. The contract covers the construction of: - a four-lane highway with two lanes in each direction and a total length of more than 5.5 km; - 13 bridges, pathways and flyovers with a total length of 4.8 km in both directions; and - 6 tunnels with a total length of more than 4 km (in both directions).	US$2,000

Airports

The main airport project was the commencement of the redevelopment of St. Petersburg's Pulkovo Airport in Russia. The first phase will include the construction of a new passenger terminal by the end of 2013 to increase passenger volumes from seven to 14 million passengers per year. Phase I will also include expanding apron areas and modernising existing airport infrastructure.

The second phase will include the reconstruction of domestic terminal Pulkovo One, which will be connected to the new terminal to unite domestic and international flights. Project value is US$1.6 billion.

Rail

Rail projects were down after the massive project announcements of the previous period. Significant projects are summarised in the following table.

Description	Amount (millions)
UK-based Crossrail will spend £1 billion to build a new Tottenham Court Road Crossrail station, upgrade the capacity of the tube station and create a new piazza.	US$1,600
The Baku Metro in the capital of Azerbaijan plans to expand the metro network to include have five routes, 76 stations and 119 km of subway lines. It also includes the expansion of existing lines and integration and linkages with other forms of public transport. The first stage of five stations and 6.8 km of line will cost US$1,200	US$1,200
Boryspil International Airport in Ukraine has entered into an agreement worth CMEC General Machinery Import & Export Company to build a rail link to connect the airport with the city of Kyiv.	US$1,000

Renewable energy

While the total investment commitment was large, individual projects tended to be relatively small with a lot of interest in photovoltaic solar plants (10 projects). However, wind still dominated in terms of value. Significant projects are summarised below.

Description	Amount (millions)
Spanish utility firm Iberdrola Renovables will begin the construction of a 600 MW wind park in Romania in early 2011.	US$1,500
Sweden-based Vattenfall has announced plans to construct an offshore wind farm off the coast of Germany with an investment of $1.4 billion. The wind farm will consist of 80 turbines which will be supplied by Siemens.	US$1,400

Power generation

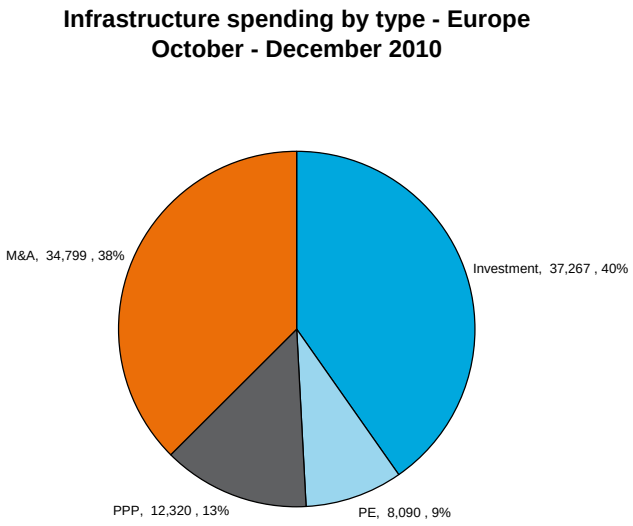
The power generation sector was relatively muted during the period, with the main interest in middle sized combined cycle gas plants.

Transmission & distribution

Ofgem, the UK's gas and electricity market regulator, has opened a £1.9 billion (US$3 billion) tender that will connect six offshore wind farms to the national grid. According to the Financial Times, the tender relates to the Gwynt-y-Mor, Lincs and London Array wind farms. The selected companies should start operating the transmission links that will allow these projects to supply up to 2800 MW to the national grid in 2012.

The connections for three more wind farms – Humber Gateway, Race Bank and West of Duddon Sands – will follow later. Balfour Beatty Capital, Macquarie Capital Group and Transmission Capital Partners won a contract to run the links for seven other wind projects.

European infrastructure investments by type – October to December 2010



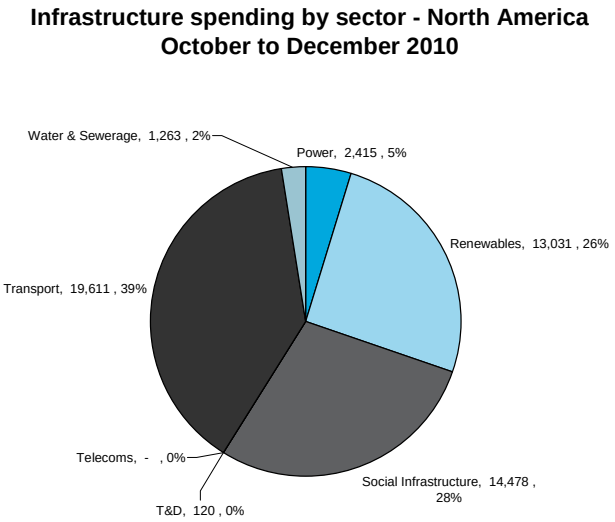
M&A activity was particularly strong during the period with most activity in communications and energy transmission. The main projects are described in the table below.

PPP value dropped somewhat relative to more traditional funding, with the largest project a major road concession in Turkey (see above).

Description	Amount (millions)
E.ON, the German utility, is to sell its UK grid distribution network, the second largest in the UK, for between £3.5 billion - £4 billion (US$5.6 billion - US$6.4 billion) to a consortium of the Abu Dhabi Investment Authority, Canada Pension Fund and Macquarie for its distribution interests.	US$6,000
UK-based telecoms company Vodafone Group PLC is to sell its 44% stake in French mobile phone group SFR for £7 billion to French media firm Vivendi S.A., which owns the remaining shares in SFR.	US$11,000
EDF's board has cleared the company to sell its UK power distribution networks to the Cheung Kong group for €3.8 billion (US$4.07 billion).	US$4,070
Swiss competition authorities approved private equity firm CVC Capital Partners Ltd.'s 3.3 billion Swiss franc (US$3.47 billion) purchase of Sunrise Communications AG, the Swiss unit of Danish telecommunications provider TDC A/S.	US$3,470

North American infrastructure

North American infrastructure investments by sector – October to December 2010



Spending on infrastructure in North America showed a significant monthly increase, with US$51 billion of new investment identified. Much of the increase came from social infrastructure which benefitted from US federal stimulus.

Renewable energy investment was also very strong with further major solar plants, both thermal and photovoltaic, being announced. Taken together with previously identified solar plants, this may represent a diversification of the renewable sector away from its reliance on wind power. The performance of these new plants will be watched with interest.

M&A activity continued its strength with US$12 billion in transactions identified during the period.

The most significant projects, sorted by sub sector, are summarised below.

Roads

The following major projects were noted.

Description	Amount (millions)
Construction is set to begin on the US$2.5 billion North Tarrant Express project, a 13.5-mile stretch of highway along Northeast Loop 820 and Airport Freeway in Texas. The project, which will double the highway capacity between Fort Worth and Euless, is planned for completion in 2015.	US$2,500
A New Jersey Turnpike widening project is underway in Burlington and Middlesex as part of a US$1,200 upgrade project.	US$1,200

Airports

Unlike the previous period, few new airport projects were announced. The main projects are described below.

Description	Amount (millions)
Dallas/Fort Worth International Airport is undertaking a US$1.7 billion capital development program to upgrade four of the airport's original terminals,and make improvements to the public access and operations aspects of the airport.	US$1,700
Atlanta is developing a new terminal at Hartsfield-Jackson International Airport. The Maynard H. Jackson Jr. International Terminal is scheduled to be complete in 2012.	US$1,200

Electricity generation

Activity in the traditional generating sector was relatively subdued with most activity in a medium scale gas fired plant.

Renewable energy

Renewables were the big movers in energy generation. The major projects are summarised below.

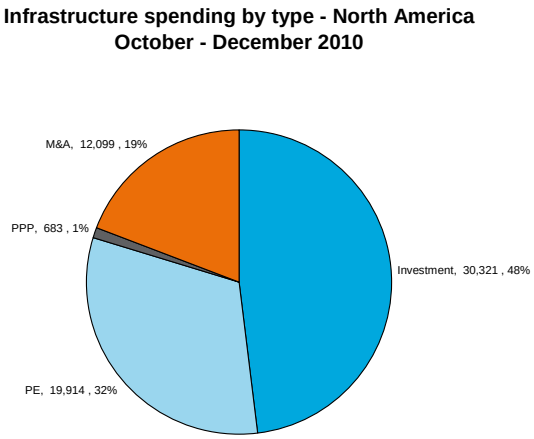
Description	Amount (millions)
The Waneta Expansion hydropower project is a 335 megawatt (MW) hydroelectric power facility on the Pend d'Oreille River, just south of Trail, British Columbia.	US$950
The Amargosa Farm Road Solar Project will house two 250 MW units and will include up to 4.5 hours of thermal storage. The total nominal generating capacity of the facility will be 500 MW. The construction of the project is expected to begin in 2011.	US$1,400
The 500 MW Crossroads Solar Energy Project will be located in Maricopa County, Arizona and incorporate ten hours of solar energy storage utilising molten salt. Power technology will be provided by Pratt & Whitney Rocketdyne.	US$1,500
Construction work on the Agua Caliente photovoltaic solar power plant is scheduled to begin before the end of 2010 in Yuma County, Colorado. The photovoltaic solar power plants will have a capacity of 290 megawatts. Construction is slated to begin before the end of 2010 with completion scheduled for 2013.	US$1,000

Social infrastructure

Expenditure of more than US$6.5 billion was split over 79 projects, with more than US$2 billion to be spent in health care. The major projects were in Canada and are described below.

Description	Amount (millions)
A US$750 million expansion of the St Catharine’s Hospital in Niagara, Canada.	US$750
The announcement of an upgrade of Montreal's Sainte-Justine Children's Hospital to modernise and build new facilities.	US$995

North American infrastructure investments by type – October to December 2010



PE investment was strong in the electricity generation sector, particularly in renewable sources, and the US health care sector.

The major PPP was a concession contract awarded to Hochtief to build and operate the Presidio Parkway in San Francisco.

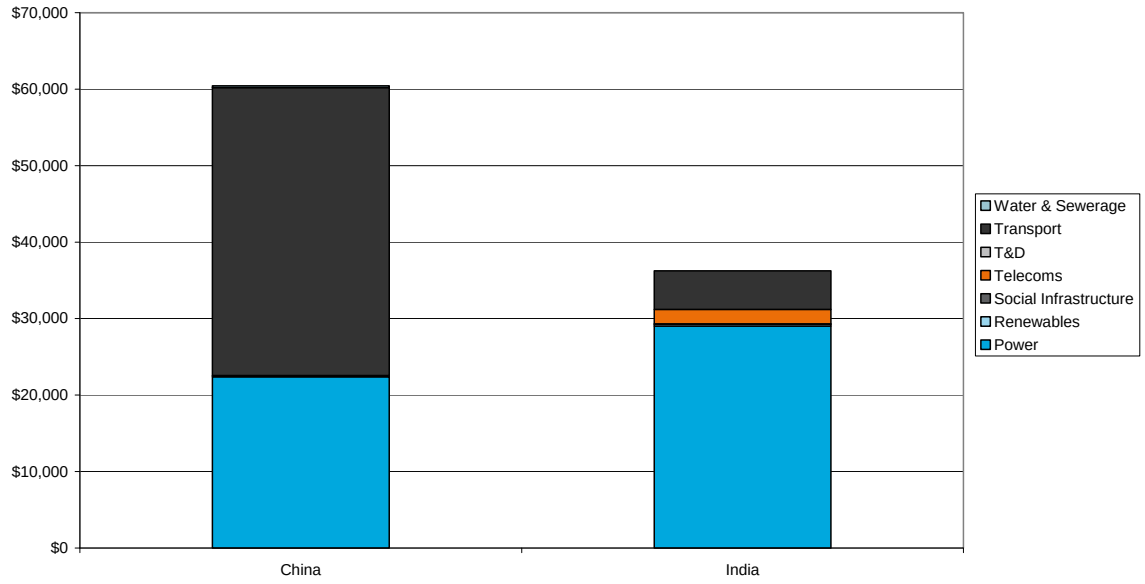
M&A activity was strong with US$12 billion of activity. The headline M&A activity is summarised below.

Description	Amount (millions)
ABB will acquire Baldor Electric Co. in an all-cash transaction valued at US$4.2 billion, including US$1.1 billion of net debt. Under the terms of the agreement, which has been approved by both companies' Boards of Directors, ABB will buy all of Baldor's outstanding shares for US$63.50 a share in cash.	US$4,200
Telecommunications giant Rogers Communications Inc. will buy 66% of the Toronto Maple Leafs in a deal worth more than US$1 billion	US$1,000

North Asia infrastructure

China and India expanded their spending in the period with US$60.4 billion and US$36.5 billion committed respectively, ex M&A activity. China's focus continued to be on the main drivers of economic activity, i.e. energy and transport, while India announced some major electricity generation projects, including a massive expansion of nuclear generation, aimed at reducing the country's chronic energy shortages.

Infrastructure spending by sector - North Asia
October to December 2010



M&A activity was relatively muted with US$1.7 billion indentified.

The major projects within each subsector are summarised below.

Power Generation

Nuclear power received a major boost in both China and India. Significant new projects announced are described below.

Description	Amount (millions)
Huaneng Power International Inc. plans to build its first water saving and eco friendly power plant in the northwestern Xinjiang Uygur Autonomous region. The Huaneng group will invest RMB5.69 billion (US$850.46 million) to build the power plant in Hami Industrial Park.	US$850
China-based Guangdong Nuclear Power Group is constructing the Yangjiang Nuclear Power Plant in Dongping Town of Yangjiang City with an investment of RMB70 billion (US$10.1 billion). The Yangjiang Nuclear Power plant will have six 1,000 MW units with the first unit to begin operation in 2013 and the remaining units are scheduled to be operational by 2017. The nuclear power plant is expected to generate 45 billion kilowatt-hours of electricity annually.	US$10,100
Russia-based AtomStroyExport (ASE) and China-based Jiangsu Nuclear Power Corporation (JNPC) agreed to build the second phase (units 3 and 4) of the Tianwan nuclear power plant at Lianyungang city in Jiangsu province, China. The project includes the construction of Tianwan units 3 and 4, which will be similar to the first stage of the power plant, comprising two Russian-designed 1,060 MW VVER-1000 pressurised water reactors. JNPC will be responsible for the design and supply of non-nuclear components	US$4,500

and equipment

China National Nuclear Corporation (CNNC) has begun constructing a 650 MW reactor in the southern island province of Hainan, China. The reactor, the second of two units to be built in the first phase, will start commercial operations in 2015. The Hainan facility will become the biggest nuclear power facility under construction and join 23 other reactors currently being built in China. The initial phase of the Changjiang plant will require an investment of over RMB20 billion (US$3 billion).	US$3,000
Ningde Nuclear Power Plant in southeast China's Fujian province has begun building its fourth generator. The nuclear power plant is expected to generate 30 billion kWhs of electricity per annum, guaranteeing a quarter of the province's annual power consumption when all the four generators are fully operational in 2015. The plant will also save 12 million tons of coal every year, or the equivalent of about 30 million tons of greenhouse gas emissions. The nuclear power plant will begin operating in 2012, making it the first of its kind in the province.	US$2,500
Reliance Power has signed a contract with GE for the expansion of its 2,400 MW Samalkot Power Plant in the southern Indian state of Andhra Pradesh. The agreement is valued at approximately INR35 billion (US$750 million).	US$750
Petronet LNG has announced plans to construct a 1,200 MW gas based power plant at its Dahej-based gas terminal in Gujarat. The power plant will consume about 10% of gas from the 10 million tonne per annum at Dahej.	US$1,500
NPCIL has launched construction for four indigenously designed 700 MW pressurised heavy water reactors (PHWRs), two each at Kakrapar in Gujarat and Rawatbhata in Rajasthan. These reactors are slated for commercial operation in the year 2015 and 2016 respectively.	US$3,000
The Indian Government has approved the construction of a 9900 MW Jaitapur nuclear power project in the Ratnagiri district of Maharashtra, to resolve the power crisis prevailing in the state. The proposed new plant is estimated to cost around US$13 billion. The plant is expected to generate power from 2016 onwards, with the first phase to be completed within the next three to four years and the remaining phases by 2018.	US$13,000
India's state-run aluminium producer National Aluminium Co (Nalco) has announced plans to develop a 1,400 MW nuclear power plant in Gujarat, India in collaboration with state-owned Nuclear Power Corp. of India Ltd (NPC). The project would require an investment of US$2.69 billion out of which Nalco's share would be around US$382 million. The nuclear project would comprise two 700 MW units	US$2,690

Roads

Road developments were numerous but somewhat smaller in scale to previous reporting periods. Activity included the following significant projects.

Description	Amount (millions)
A 144.75 km ring road in Jaipur, India is scheduled to commence construction in February 2011. The ring road is planned to be constructed in three phases. The project is expected to be completed by 2013.	US$1,200
Upgrading work on China’s Hohhot-Baotou highway is now underway in a project worth US$1.5 billion. The Hohhot-Baotou highway forms part of the Beijing-Tibet highway.	US$1,500

Airports

The Chinese government continued with its investment in 25 airport projects in 2010. Estimated expenditure in this program over the period is estimated at US$3.5 billion. Airports also received significant attention in India with investment exceeding US$1 billion over the same period.

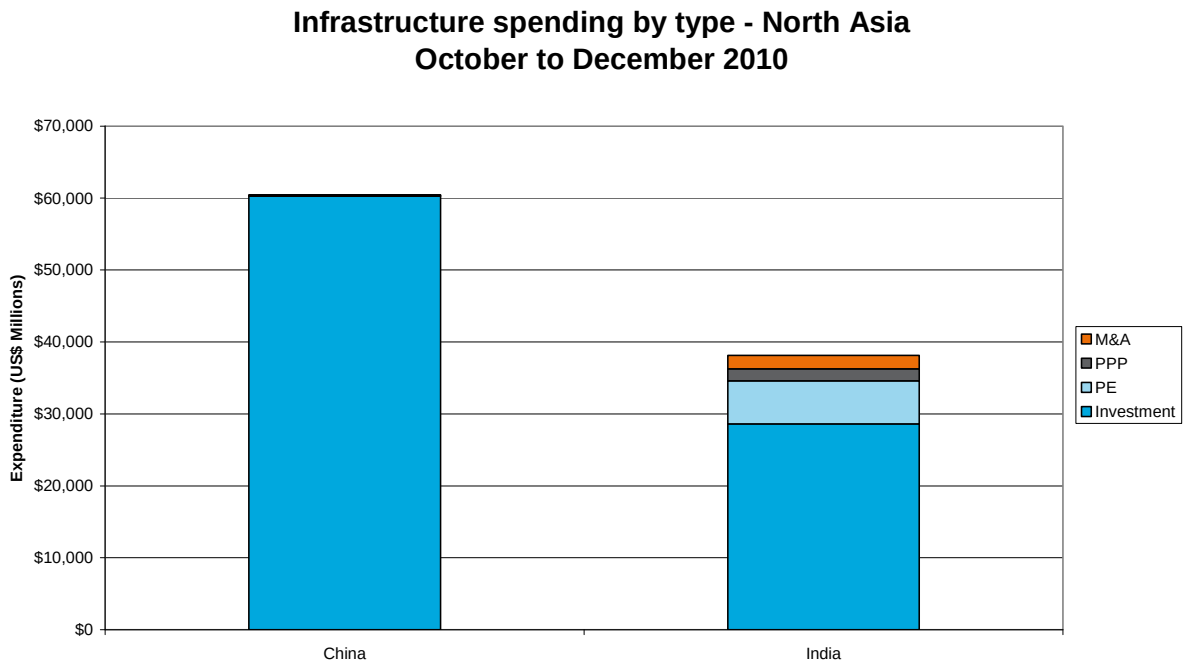
Rail

China’s high-speed rail developments may have suffered a setback with China's former railways minister under investigation for allegedly embezzling more than RMB800 million (US$121 million), state media reported. Liu Zhijun was forced to stand down last month after the authorities launched an investigation for "serious disciplinary violations".

This may signal a reconsideration of china’s ambitious and expensive development of a high-speed rail network. However, during this period a number of significant projects were announced.

Description	Amount (millions)
Construction of a high-speed rail link between Yunnan province in China and Yangon in Myanmar will begin. After completion, the 1,920 km line will have trains running at about 170-200 km/h.	US$15,000
China will begin construction of a new high-speed railway between Xi’an and Chengdu by the end of 2010. The RMB70.8 billion (US$10.6 billion) railway is expected to take four years to build. The railway line will pass through Hanzhong City, Shaanxi Province, and the cities of Guangyuan and Jiangyou in Sichuan Province. It will also be the first line to run through western China's Qinling Mountains. Nearly 135 km of the line will cut through the craggy region, requiring the boring of 127 km of tunnels.	US$10,600
The Shanghai metro will develop a Line 13, which will be 16.4 km long and have 14 stations. The line will be operated by 24 trains.	US$3,100

North Asian infrastructure investments by type – October to December 2010



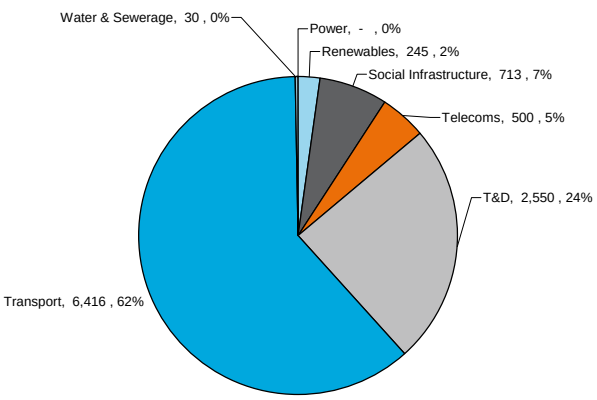
Government spending funded the vast majority of projects committed to in the period in both countries. In India, the low PPP penetration relates more to the limited number of road projects announced in the period than to any change in government policy.

M& A activity was muted as described in the table below.

Description	Amount (millions)
China's state-controlled Huaneng Group will buy the Indian company GMR Group's entire share in US-based power utility InterGen. The Huang Group is China's largest power producer.	US$1,230
The majority of Motorola's public carrier wireless network infrastructure assets in China are being acquired by Nokia Siemens Networks subject to approval by the Anti-Monopoly Bureau of the Ministry of Commerce of China. All other necessary regulatory clearances have been obtained.	US$500

Australasian Infrastructure

Infrastructure spending by sector - Australasia
October to December 2010



Infrastructure spending in the region maintained its momentum with US$10.5 billion in projects announced.

Overall, the transport sector continued its strength, accounting for more than 60% of the total.

In Australia, Transmission & Distribution spending continued as previously advised. This level of expenditure is expected to continue through to 2014.

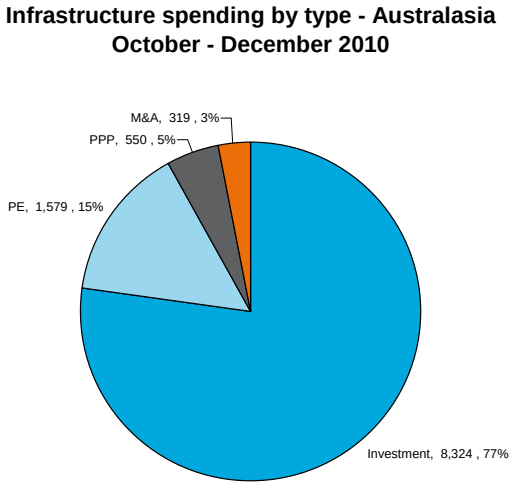
Debate continues around the introduction of a carbon pricing scheme, with the Australian Government proposing an initial carbon tax which would metamorphose into a trading scheme after three years. Issues around the level of tax required and compensation to affected industries are unresolved. The combination of the major transmission and distribution upgrade, discussed previously, and inefficient carbon abatement schemes, which include subsidised roof-top solar panels, are expected to force up the cost of electricity to the consumer up by 30% in the next few years, even without a carbon tax. As a consequence, investment in new generation capacity remains on the back burner while mandated expenditure on renewals continues.

As flagged in our previous report, Australia's ambitious National Broadband Network aimed at bringing optical fibre networks to the door for 93% of Australian households, continues to face strong political and commercial pressure. However, the first parts of network have been rolled out in Tasmania, servicing about 4000 households.

Other projects of note include:

- Fortescue Metals Group is duplicating its 120 km existing main line in Australia. In addition it will construct a 130 km spur line to Solomon and upgrade other infrastructure. Investment will exceed US$750 million with earth works for the main line duplication beginning in early 2011.
- Contracts have been awarded to construct South Australia's US$820 million South Road Superway. The project is South Australia's largest ever investment in a road project as well as the state's most complex road construction and engineering project.
- Transurban Group will undertake a US$ 550 million upgrade of the Hills M2 motorway in North West Sydney. The Hills M2 Upgrade will incorporate the widening of existing sections of the roadway from two to three lanes including the Norfolk Road twin tunnels, the addition of new access ramps, and the upgrade of operational management and control systems.

Australasian infrastructure investments by type – October to December 2010



M&A activity was very muted, while PPP and PE activity were also down.