Reforms of the early 1990s have led to economic growth of 7% pa, twice the average rate in the preceding decades. Confidence in the fundamental strengths of Indian economy and its demonstrated resilience has led to a steady flow of investment. Further, the growing middle class has created a market that has caught the world's attention.

While economic reforms have provided an impetus, sustainable growth requires adequate social and economic infrastructure to ensure productivity of capital. Underinvestment and poor implementation have led to infrastructure constraints that pose serious challenges.

Public Infrastructure in India has traditionally been owned by the state. However, given the constraints within the traditional government apparatus, it has increasingly solicited private sector participation in its development through the Public Private Partnership (PPP) format.

PPP shifts the onus of successful outcomes to the private sector partner while providing rewards commensurate with risk.

The governments at the Centre as well as the states have progressively opened more Infrastructure sectors to PPP by developing the attendant regulatory, contractual and oversight framework. These frameworks have evolved to include lessons learnt over a decade and a half and now include best practices, model contracts and financing formats.

In addition to drawing on private sector capacities, the PPP format has successfully attracted financing from non traditional sources such as commercial banks, financial institutions and institutional as well as retail investors. Further, private sector role play is rapidly evolving from mere implementation to design and solutions, reflecting a paradigm shift in the state's traditional "procurement" approach to the private sector to one of "partnership".

According to the Planning Commission of India, infrastructure investments are estimated to touch 8% of GDP by the end of the current five-year plan. The share of private investment in infrastructure is estimated to account for 2.9% of the GDP in 2010-11 (or almost 37% of the investment in infrastructure).

Exhibit 1: Infrastructure investments in India (at 2006–07 prices)

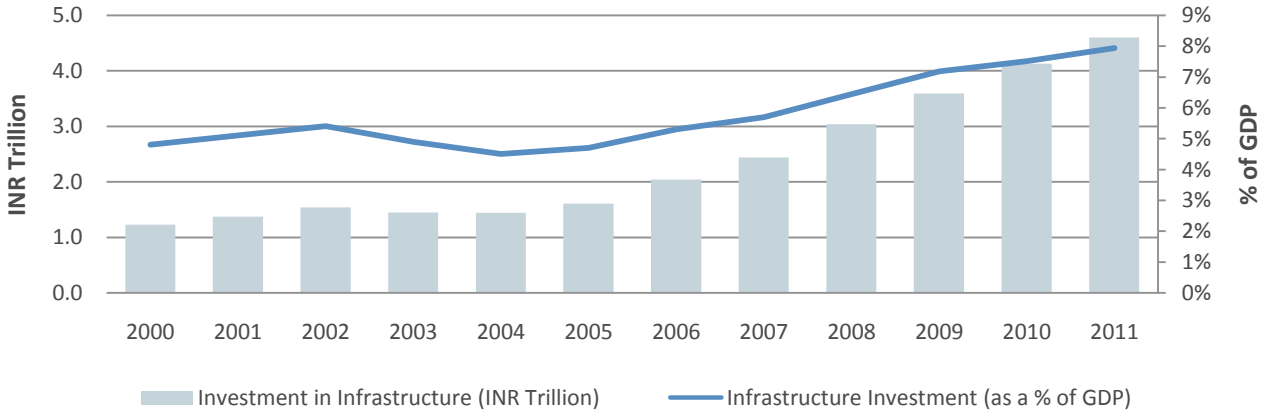
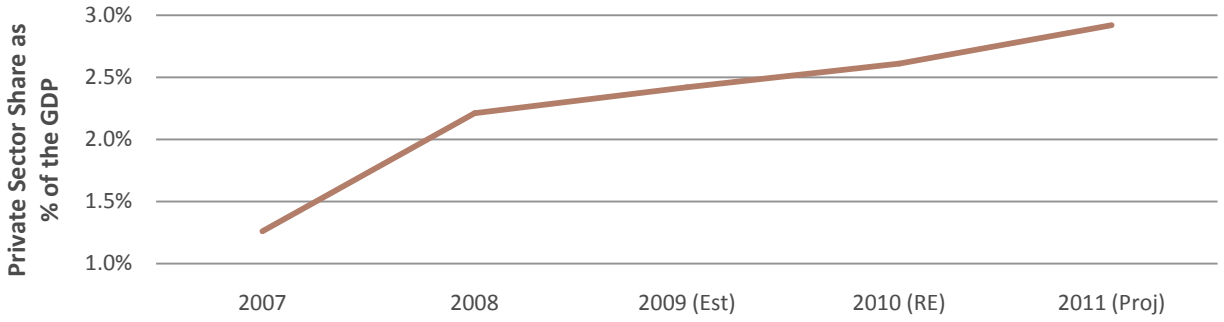


Exhibit 2: Share of private sector in infrastructure development as % of GDP (at 2006–07 prices)



However, private sector participation in infrastructure has shown a wide variation across sub-sectors, largely reflecting basic sector characteristics (eg, technology, competition, cost recovery, and legal and regulatory requirements), the pace of policy development, institutional environment and the approach of the government. Energy, telecommunications and transport accounted for most of the private sector investment in infrastructure in India during 1998–2011.

Table 1: Growth of infrastructure capital: 1998–2011*

Sector	1998	2011	% increase
Power			
Capacity ('000 MW)	89,167	170,229	91
Units generated (billion kWh)	420	837	99
Roads			
Length (million km)	3.3	4.2	28
National highways (000 km)	35	71	101
Ports			
Traffic handled (million TEUs)	2.5	8.0	226
Rail			
Route (km)	62,800	65,000	4
Goods transported (billion tonne-km)	300	525	75
Airports			
Passengers handled (million)	16	50	213
Cargo handled (million tonnes)	525	1,225	133
Telecom			
Wireline & mobile subscribers (million)	31	800	2,481

* Note: Statistics do not reveal the improvements in the quality of services – dependability of power supply, lower T&D losses, reduced tele-congestion, higher efficiency at ports and airports and four-six laning of roads

Ports

Between 1947 and mid-1990s, port development was primarily limited to projects undertaken by the government. Private investment was constrained by large investment requirements, long gestation periods and paucity of capacity in a nascent private sector..

In 1995, global bids were invited for the privatization of terminal operations at Jawaharlal Nehru Port Trust (JNPT) on a BOT basis, and the concession was granted to P&O Ports in 1997. Subsequently, the process of private participation in the port sector gained momentum with the container terminals at Tuticorin, Chennai, Visakhapatanam, and JNPT 3rd Terminal being awarded to the private sector on BOT format. These ports generated significant interest as they had an established traffic history and available infrastructure including breakwater, marine channel and rail/road linkages, thereby limiting additional funding commitments from the private sector operator.

Almost simultaneously, in 1998, the Gujarat government granted a concession for the development of the minor port at Pipavav - the first significant non-major port to be developed by a state. It also marked the first domiciling of a port in a company, subject to a stringent project development process and project finance borrowings from commercial banks and financial institutions. This was followed by a concession for development, operations and maintenance of the port of Mundra.

Unlike major ports operated by Port Trusts, the Greenfield state level non-major port projects did not have physical and business infrastructure in place. Therefore, private sector operators had to commit to significantly higher investments and take higher commercial risks.

Financing early projects

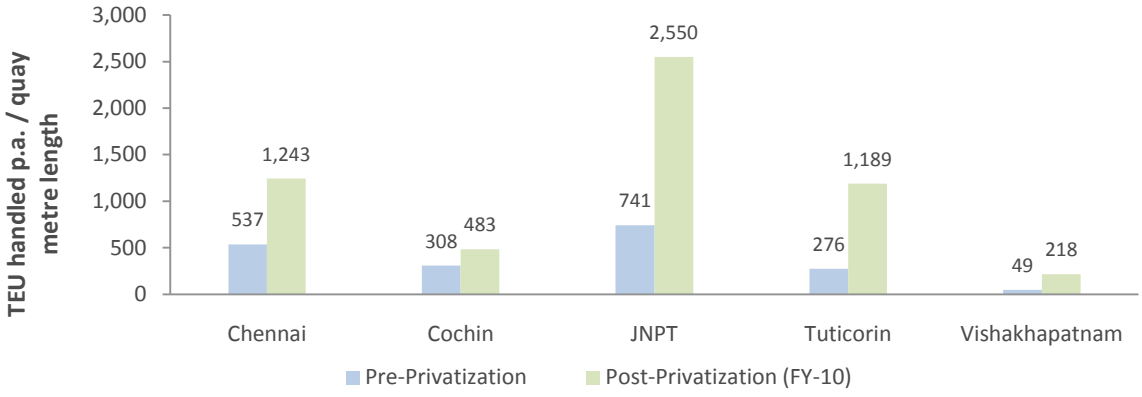
In the initial projects limited experience of domestic FIs /banks in appraising and financing port projects led them to adopt a more cautious approach. Financial institutions (FIs) sought guarantees from parent companies given the inadequate track record of India's private port operators, and a lack of experience in the domestic port sector on the part of foreign players.

Impact of private sector participation

Private sector participation in the sector re-positioned port services as market-driven, cost-sensitive and operational standards-driven business activity benchmarked to globally accepted norms of market competition and efficiency.

Ports now seek to optimize traffic from their cargo hinterlands. Consequently, there has been increasing inter-port and inter-terminal competition often resulting in better handling technology and practices, and an improvement in overall port efficiency.

Exhibit 3: Efficiency improvement at port terminals



Issues

Multiplicity of concession agreements: Initially, each nodal agency developed its own concession agreement. There is now a "model concession agreement", but this is unable to address local and transaction-specific issues adequately.

Policy guidelines: The initial practice of inviting bids based on the royalty offered by private players has subsequently been replaced by the revenue-share model. This mid-course change has adversely affected some projects awarded during the royalty regime. Another significant guideline that has undergone a change is the non-compete condition limiting intra-port competition among terminals.

Uncertainty over tariff setting philosophy: The methodology for determining tariff for private terminals has undergone mid-course revision. The revised cost plus model of Tariff Authority for Major Ports (TAMP) does not consider revenue share paid to the respective port trust as a cost element. There is also now an emerging debate on either removing the role of TAMP altogether or bringing state government controlled non-major ports under TAMP in a revised legal or policy framework.

Conflict of interest: The revenue share model emphasises the landlord port trust's focus on maximizing rental revenue, sometimes leading to uneconomical user charges. Further, the "cost plus model" for tariff determination does not suitably incentivise operational efficiency and cost reduction. In addition, the landlord port trusts also compete with the private terminal operators resulting in conflicting roles and interests.

Coordination between central and state governments: Different port policies and development plans of the central and state governments result in development rights being offered to multiple operators in geographic proximity, thereby impacting individual project viability.

Hinterland connectivity: Often the private sector is required to develop adequate rail and road evacuation infrastructure to ensure cargo at the Greenfield port, significantly increasing risks and costs to the project.

Project development: The state governments have invited bids for projects at a stage when the project risks are not known, land acquisition is incomplete and environmental clearances are not obtained, thereby exposing the private player to significant risks.

Conclusion

While private terminals at major ports are subject to limited returns due to high revenue shares and TAMP determined tariff ceilings, investments in state ports are limited by the high degree of risks borne by the private sector. The lack of a uniform country-wide policy and regulatory framework inhibits large scale private sector investment in the sector.

Way forward

There is a need for a national port policy and independent maritime regulator that plans, develops and coordinates national port development on the one hand, and ensures sutatinability of long term investments on the other.

In addition, there may be a need to explore new PPP models that focus on procuring services and not just assets — output-based model for ports.

Roads

The road network in India aggregates to ~4.2 million km. The second-largest in the world, it caters to ~65% of India's freight traffic and 80% of passenger traffic. National highways with a network of 71,000 km (~2% of the total network) cater to nearly 40% of the total road traffic. This seemingly large road network, however, is still inadequate to meet the accessibility and mobility requirements of a country of India's size and population.

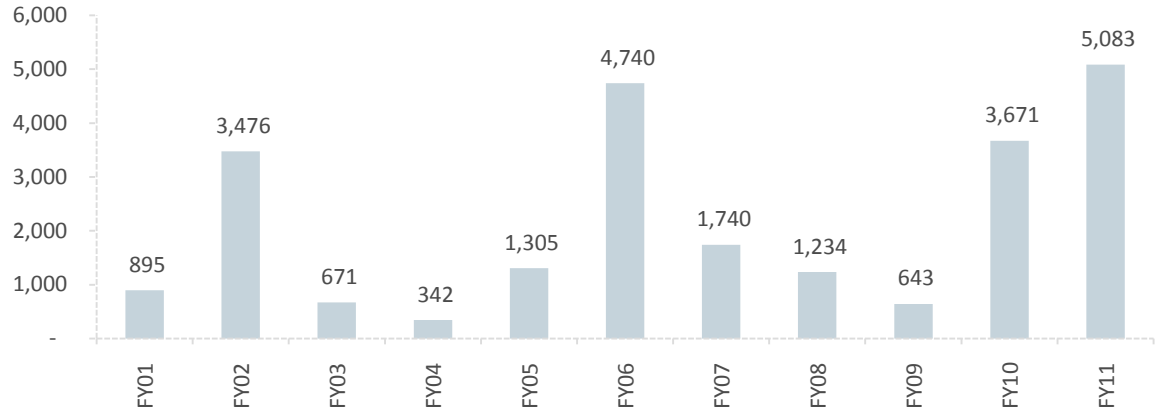
In 2001, the National Highways Authority of India (NHAI) launched the National Highways Development Program (NHDP) to connect four metropolitan cities: New Delhi, Mumbai, Chennai and Kolkata. Since then, NHDP has expanded in scope and coverage as the economy has grown.

The PPP initiative in the roads sector has been largely on a BOT basis, with the policy framework being approved in 1997. In 2005, it was decided that all future programmes/projects under NHDP would be awarded only on a BOT basis. From NHDP Phase-III, all contracts for provision of road services are thought to be awarded only on a BOT basis (either based on toll or annuity or a suitable toll/annuity hybrid), with EPC awards being made in specified exceptional cases only.

The NHDP has been successful and has elicited the largest interest of the private sector among "classical infrastructure projects" largely due to the policy initiatives undertaken by the government, including land acquisition and utility removal, the availability of right of way, and uniformity in tariffs for public funded and private investment projects.

However, the pace of award of road projects has varied significantly due to multitude of factors, including political uncertainty, elections and litigation.

Exhibit 4: Award of NHDP projects y-y



Following the success of the NHDP, several state governments have also incorporated state road development corporations as nodal agencies for the development and implementation of projects, albeit with somewhat limited success due capacity constraints in terms of both policy formulation and implementation support at state level.

Issues

Unavailability of historical traffic data: In the absence of reliable historical data traffic projections become challenging.

Absence of long term regional development plans: Commercial viability of toll roads depend on regional economic development. In the absence of long term regional planning assessing commercial viability of toll roads becomes difficult.

Independent regulator: The absence of an effective and autonomous regulator is a hurdle to attracting long term low cost capital

Land acquisition: Land acquisition procedure has remained inconsistent under the NHDP with the onus gradually shifting to the concessionaire. This combined with the new land acquisition act may lead to project delays and SPV level litigation.

Environment and forest clearances: Additional conditions and demands for compensatory afforestation, dedicated strips for plantation and staff quarters have delayed projects.

Differential cost assumptions by NHAI and contractors: NHAI has historically assumed lower costs for projects, which has led to lower caps on viability gap funding and issues related to financial closure.

Capacity of the Construction Industry: The capacity for implementing quality road civil work remains inadequate in light of NHAI plans.

Way forward

Road regulatory authority: There is a need for a road regulatory authority that ensures level playing field for all participants and ensures compliance with concession agreements. In addition, the authority must have effective mechanisms for grievance redressal and judicial powers for dispute resolution, as well as the ability to provide some flexibility in the concession structure itself.

National transport policy: India does not have a comprehensive national transport policy that considers growth of competing modes of transport. This often leads to duplication of infrastructure and pose risks to BOT road projects due to the possibility of traffic diversion. In the medium term, a road network policy needs to be planned that addresses issues of competing facilities, toll policy etc.

Flexibility in design: The cost of developing infrastructure is similar across the world; however, the ability to pay is not. Therefore, the optimal design solution will vary according to the situation and the available resources: engineering-driven solutions can generate the required capacity at lower costs.

Airports

The civil aviation traffic has grown significantly over the past few years, primarily on account of growth of the Indian economy, growing tourism industry and the entry of low-cost carriers in the private sector. However, airport infrastructure has not kept pace with growth of civil aviation traffic, resulting in congestion and inefficient services at major airports.

The process of development of airports through private capital began with Cochin International Airport Limited (CIAL) in 1993, which commissioned the Cochin Airport in 1999 on a build-own-operate model.

The privatization initiative in the airport sector intensified with the amendment of Airports Authority of India Act, 1994, to provide for exclusion of “private airports” from the ambit of AAI Act. The Aircraft Rules, 1937, were also amended to facilitate conditions for grant of licence, validity of licence, tariff fixation, including levy of passenger service & user development fee and ground-handling provisions.

To ensure the development of Greenfield airports at Bangalore (Devanahalli) and Hyderabad (Shamsabad), the state governments of Karnataka and Andhra Pradesh offered significant fiscal benefits, including grants, interest-free loans and concessional land lease. However, the modernization process of the Delhi and the Mumbai airports were inordinately delayed due to controversies regarding the bid criteria and changes in the selection process.

Currently, several Greenfield airports (including Navi Mumbai and Chandigarh) and Brownfield airports (including Kolkata and Chennai) are currently under development and/or implementation. In addition, AAI has identified 35 non-metro airports for development.

Issues

Limited private sector participation: Only five airports have been developed/modernized with private sector participation since 1994. As airports are often viewed as strategic for national security, their privatization often meets political resistance.

Long-term planning: A comprehensive plan for the development of the airport sector needs to be prepared that outlines the infrastructure gaps in the sector and the possible areas of engagement with the private sector.

Lack of a regulatory framework: The past privatization experience involves three different models. A standard regulatory framework with clearly defined bidding procedures and model concession agreement are required.

Support from state governments: The financial viability of airport projects is limited without substantial earnings from non-aeronautical streams. But this requires extensive city-side development and hence land acquisition for which local government support is necessary.

Flexibility in concession structures: Greenfield and Brownfield airports developed in non-metro areas may not be financially viable. To encourage private investments in such airports, the airside development may be undertaken through BOT annuity basis and the non-airside and the operations and maintenance may undertaken on a BOT revenue-sharing basis.

Tariff setting principles are not defined: The proposed independent Airport Economic Regulatory Authority needs to be expedited with clear definition of the scope of regulation, setting of aeronautical price ceiling and service quality performance standards for private players.

Participation by airline companies: In the bidding process for Delhi and Mumbai airports, equity ownership in the joint venture companies by scheduled airlines, cargo airlines and their group entities was limited to 5%. In the maritime sector, shipping lines have traditionally shown keen interest in private sector port development in India. By ruling out the airline companies, a significant part of the investor community is being excluded from the privatization process.

Lack of focus on small airports: Smaller airports at key locations in India might provide the much required momentum to the privatisation process, by reducing the risk and minimum investment exposure of such projects.

Way forward

A clear regulatory framework along with a clearly defined process for selection of private entity needs to be established. This framework needs to suitably include the role of state governments and local authorities. Also, the framework needs to provide for the roles and responsibilities of an independent regulatory authority for the sector. In addition, focus needs to be drawn to development of small- to medium-scale airports in non-metro cities that have lower land requirements and substantial potential for city-side developments.

Railways

Since Independence, the development, operations and maintenance of all railway projects has been managed by the Ministry of Railways (MOR). The private sector's involvement was limited to outsourced construction, wagon manufacturing, stores and component supplies, and catering, through a tendering process. End users of freight services could have their own sidings for captive use, and engage handling contractors for loading and unloading at railway terminals.

In 1986, City Industrial and Development Corporation (CIDCO), a Maharashtra undertaking, contributed two-thirds of the project cost for providing rail connectivity to Navi Mumbai — the first non-MOR sponsored development in

the country. The Konkan Railway Corporation (KRC) was incorporated as a joint venture (JV) between MOR and the state governments of Maharashtra, Goa, Karnataka and Kerala, to develop a 738-km rail connectivity project between Mumbai and Mangalore on a build-operate-transfer (BOT) format. In 2008, MOR assisted KRC to restructure a large part of its debt as equity, and removed the 10-year 'transfer' clause, making KRC a build-own-operate (BOO) project.

These projects provided an impetus for state government involvement in rail connectivity projects. In addition, port connectivity projects attracted the involvement of ports and major industries. Seven port connectivity projects have been implemented and/or are under implementation under the PPP framework. In addition, private railway lines were have been developed between Adipur and Mundra and more recently connection of the East Coast Rail line to Dhamra Port. Following the successful development and implementation of these projects, several private players initiated proposals for the development of new railway lines. To facilitate this, a new rail connectivity policy called Railways' Infrastructure for Industry Initiative (R3i) was promulgated for attracting private sector participation in rail connectivity projects. Owing to the restrictive nature of the policy, no additional projects have achieved finalisation.

Since 2006, MOR has tried to redevelop 50 railway stations to world class standards through the PPP format. Other initiatives for private sector participation include setting up of electric locomotive factory at Madhepura, diesel locomotive factory at Marhowra, coach manufacturing at Kancharapara and ancillary unit of CLW at Dankuni. The Indian Railways also planned for development of high speed corridors under the PPP framework. However, progress on almost all MOR initiates has been slow and none of these projects have progressed beyond the planning stage.

A number of freight marketing schemes have been launched by the Railways for investments in terminals and wagons. However, there are still no confirmed takers or concession agreements that have been executed. The private sector perception about most of these schemes is that they are unfairly loaded in favour of the Railways with unattractive returns and high risks for the private player.

PPP initiatives in the Railway sector have suffered from a variety of conceptual and implementation problems, as a result of which this sector has seen less than 4% of its targeted investment originating in the private sector.

Issues

Clear definition of project structure: The Indian Railways must clearly define the space it is vacating the roles and responsibilities of the Railways and private parties are nor clearly structured.

Clear distinction between "rail users" and "infrastructure investors": The existing schemes focus largely on rail users as potential investors. This results in projects being structured around captive usage and discount-based earnings, making them unattractive to infrastructure developers / investors.

Clarity on the financial structure: Policy formulation needs to ensure that any restriction on investor returns is "fair" not just to the Railways and the perceived "public benefit", but also to the investor. The current practice of restricting benefits to investors only until an artificially defined "recovery of investment" period should be discontinued.

Creation of "level playing field" and protection of investor rights: In many schemes currently operated as freight marketing schemes by the Railways, the role of the Railways itself gets conflicted since as an organisation it is involved as:

- Regulator – Awarding and monitoring concessions
- Service Provider – Providing the service of rail haulage to cargo marketed by private parties
- Competitor – the Railways itself marketing for cargo

Wherever there is an overlap of operations between the private sector and the Railways, it must ensure that the investor's rights in terms of physical access or cost paid for service or network access is not differentiated.

Way forward

In a sector where the primary concern of the investor is the regulatory risk an independent regulatory body free of the conflicting role-play of Indian Railways is the key to attracting private sector participation. Further, PPP projects need to be structured such that there is an adequate balance of risks and rewards available to the private sector.

Power

Power sector reforms in India began with the economic liberalization in 1991. As a first step to the reforms process, the state electricity boards were split along generation, transmission and distribution functions. The private sector was allowed to generate power, but only backed by long term contracts with state owned monopolies. In some cases, sovereign guarantees were provided to independent power producers to meet their demands for assistance in achieving financial closure.

This early stage of privatization had limited successes due to politicization resulting in irrational and skewed tariff regimes. The introduction of the Electricity Regulation Act in 1998 led to the establishment of regulatory commissions at the centre and states. The legislation had limited impact on state-owned monopolies.

In the second phase of reforms, seven states enacted their own laws and adopted the so-called "Orissa Model". This is essentially a "single buyer" model where all power generating companies sold their power to the state-owned transmission monopoly through negotiated Power Purchase agreements (PPAs) on a cost plus basis leading to comparatively higher tariffs and no efficiency gains. The transmission and distribution (T&D) losses continued and the financial losses of the distribution companies ended up getting surreptitiously financed through non-payment of dues to the state-owned transmission monopoly.

The third phase of reforms started with the enactment of The Electricity Act, 2003. This legislation liberalised the generation of electricity and recognized power trading as a separate activity. The Act also provided for the distribution of electricity through a distribution franchisee, allowing an entity to undertake distribution of electricity for a specified area.

The Electricity Act was amended in December 2003 to include a time period of five years to institute and operationalize "open access" for all customers with a usage of 1MW or above. However, monopoly distribution

companies have prevented open access, and hence competition. Open access is now expected to be operationalized from January 2012.

In 2005, nine ultra mega power plants (UMPPs) were planned on BOO basis. Only four of these projects have been successfully awarded so far. Further, several hydro power projects have been successfully awarded to the private sector on BOOT basis.

Privatization of the distribution business has been structured such that it has failed to increase competition. Government monopolies in the distribution business have been replaced by private sector monopolies. Areas within cities have been opened for private sector distribution but without introducing a choice to the customer.

Issues

Capacity shortfall: Project execution delays have been one of the key reasons for non-achievement of the planned capacity addition (variances across five-year plans have been as high as 50%) due to inadequate project preparedness, shortage of equipment and delays in achieving financial closure.

Fuel availability: Progress of a number of projects has been adversely affected due to non/low availability of fuel (coal and gas). Due to issues with forest and land clearance of coal mines, captive coal blocks/CIL production has almost stagnated. Gas production has also seen a decline and a number of power plants are operating below optimal levels. To ensure continued fuel supply, several power generators have started to acquire and develop coal mines in international geographies. However, procuring coal from these countries continue to be challenging due to political and legal risks and issues with evacuation infrastructure.

Transport Infrastructure: India faces significant capacity shortages in both rail and port sectors. To manage the fuel supply risks, several sponsors are developing and investing in the relevant supply infrastructure, including wagons, ports and jetties, which require alternate skill sets. This has resulted in higher project costs and execution risks.

Land acquisition: Lack of government support and political will has lead to longer gestation periods with respect to land acquisition for power plants.

Project execution: India does not have the experience of financing and executing large power project like the UMPPs. Apart from raising finances for the projects, delays in implementation may put significant pressure on developers/suppliers to meet performance commitments.

T&D losses: The high T&D losses result in lower efficiencies and higher costs that are either subsidised by the government or are directly passed on to customers. Local support from civic authorities and strong political will are a key determinant to minimising T&D losses.

Transmission companies add margin: Transmission companies must not buy or sell power but should only focus on transmitting power on payment of regulated wheeling charges. Also transmission companies must provide an open access to their transmission network.

Lack of open access: Lack of open access has led to private monopolies thereby completely defeating the purpose of privatization.

Conclusion

Among infrastructure sectors, the power sector is crucial for the backward and forward linkages that is necessary for overall economic development. Reform in the sector has so far seen serious attempts for open access and true competition getting taken over by inefficiency, shortage, high cost and price regulated monopolist framework.

Way forward

Open access, which is the stated objective of the forward looking Electricity Act, 2003, in turn is expected to focus on improved efficiencies, lower costs and competitive pricing. The power deficit within the country provides significant market opportunity that will attract investments in the sector, provided the so far "elusive" open access model is implemented in spirit.

Key challenges to infrastructure development in India

Government policy: There has been a lack of an integrated institutional policy formulation and implementation framework for project identification, development and implementation.

Institutional capacity: Several sector nodal agencies lack capacity to assess the need, evaluate options and structure projects on commercial principles. A well-defined institutional framework also needs to clearly delegate responsibilities between various government departments. Transparent rules and regulations for approval process assuage the participants' concerns.

Regulation: The existing institutional structure in many sectors does not provide for clear separation of owner and provider functions. **Independent regulation** plays a significant role in dispute resolution, fixation and revision of tariff and monitoring of contracts. A good regulator strikes a fine balance between investors' legitimate concerns in getting a reasonable return, the genuine needs and requirements of users and governmental concerns of getting value for public investment.

Project development: A key challenge to developing infrastructure projects in India is the non-availability of investment-grade information that includes market demand, sustainable tariffs and land values.

Land acquisition: Land acquisition in India has historically been an emotive issue. Further, often the government compensation for land acquisition are lower than the perceived market rates, resulting in discontent and disputes among the project affected persons (PAPs).

Financing: It may be difficult for the private sector to raise the significant resources required for infrastructure development, given the quantum of funding required, and India's still nascent corporate debt market.

Banks and FI funding has largely been on the back of government guarantees. This has meant they have developed limited expertise of project appraisal, project financing and taking commercial risks.

Equity investments: A large part of a project risks are either mitigated or understood on stabilization of its operations. It can then be positioned to raise incremental resources by inviting long-term investors (insurance and pension funds) looking for stable (annuity) returns. However, investments in infrastructure assets in India tend to be relatively illiquid, as most concession agreements stipulate a graded equity holding period. This limits the

project sponsors' ability to 'recycle' risk capital that is required for funding additional projects. In addition, this stipulation has prevented long term investments in the sector.

Conclusion

With a population of 1.2 billion, India is the world's largest democracy, and increasingly a significant driver of the global economy. There is a palpable sense of confidence and assurance as India finally seems to be delivering on the promise that it has offered for so long.

With growth of the economy, there is a growing demand for increasing capacity and enhanced levels of service in the core infrastructure sectors. To sustain growth momentum, active participation will be required from project sponsors, investors and lenders. PPP creates an environment of mutual trust among participants — the government, sponsors and financiers, reducing risks and increasing the long-term value of the projects. If structured properly, PPP can be a powerful tool to address India's infrastructure deficiency.

PPPs are not a panacea. Rather, they are a tool that the government has at its disposal for facilitating infrastructure delivery — a tool that requires careful application. It is only by making the best use of the full range of delivery models that are available and by continuing to innovate the government can maximize the likelihood of meeting its infrastructure objectives.