



The Indian economy had been growing at an impressive rate of over 8% during the last few years, second only to China. The Indian Power sector has also grown at a healthy rate of 7-8% over the last few years. However, the ongoing global economic crisis and consequential liquidity crunch has hit the Indian economy as well, though the impact is much less in intensity as compared to several other economies around the world. The projected Indian Power requirement at the current growth rate is still expected at 6-6.5% per annum, largely driven by strong internal demand though the recession has definitely slowed the pace. India's Energy requirements are expected to grow at 6-7% per annum. The progress in the Indian Power sector, with current electricity shortages of over 16% of peak and 10% of energy will be one of the key determinants of the future growth and one of the primary growth engines of the economy.

11th Plan Targets

In the 10th Plan period (2002-07), the government had envisaged an additional power capacity of 41,110 MW. It ended the Plan with a capacity addition of only 20,950MW, 49% short of the estimate. The government cited delays in technology alliances, lack of funds and natural calamities such as floods as reasons.

A capacity addition target of 78,700 MW had been planned by the Government of India for the 11th Plan. This does not include capacity addition of at least 12,000 to 15,000 MW by the captive power plants. It is further expected that capacity of 100,000 MW each would be required in the 12th and 13th Plans

to meet the growing demand for power. The Planning Commission may however go for a correction in the 11th Five-Year Plan targets as it gears up for mid-term assessment of goals next year in view of the global financial meltdown's impact on the economy.

As things stand at the end of first two years of the Plan period, India appears to have missed the capacity addition target once again, as it did in 10th Plan, when the actual addition was around 23,000 MW against the target of 41,000 MW. Against the capacity addition target of 11,061.2 MW for 2008-09, only 3,453.7 MW (31.2% of the target) has been achieved. This is for the second year in succession of the 11th Plan that we have missed the target. In 2007-08, a capacity addition of 9,263 MW was achieved against the target of 16,335.20 MW.

The Central Electricity Authority has attributed slippage in the capacity addition to the delays in the completion of contracted works, shortage of manpower and in some cases, problems in the fuel linkages. Slippage has also been attributed to the change in definition of commissioning of thermal power projects.

Generation

Land acquisition and statutory clearances have remained major road blocks for power project developers. However, the Centre and states have arrived at a consensus that special incentives need to be offered to states that will facilitate faster allocation of land and expedite the process of clearances for power projects thereby accelerate capacity addition. Such states would be allotted more power by revisiting

the power allocation formula. However, it will be done in a manner to avoid any rise in power cost or any problem in evacuation of power.

The Planning Commission has however, indicated that of the proposed capacity addition of 78,700 MW, the country would be able to achieve just 40,000 MW as there have been problems in procurement of plants and equipment. Thus a special policy may be developed to support a concrete capacity addition and the Centre and states have reportedly arrived at a view that the proposed policy will have to address issues relating to enlargement of domestic manufacturing capacity of balance of plant equipment, development of skilled workforce. An agency in each state will be made possible for centralized planning.

Fuel availability is also a major issue confronting the sector and fuel shortages are being experienced by all thermal and nuclear plants resulting in sub optimal performance of the state. Therefore, it has been decided to pursue development of specialized ports and jetties well equipped with coal handling infrastructure, development of adequate port, railways and roads infrastructure for transportation of coal to power plants. Moreover, the Centre and States have also called for upgrade of coal mining facilities and desired quality of coal. Procurement of gas will also have to be given priority, as gas based plants are under performing or using costly fuel. Lack of availability of fuel is also a reason for keeping on hold commissioning of some power plants.

The capacity addition figures have also dropped down as a result of the recently changed definition of commissioning of power generating units. In a bid to rectify the inflated official figures of capacity addition, the Power Ministry had announced in August 2008 that a generating unit should be declared commissioned only when it achieves Commercial Operation Declaration - the last of the five stages of completion. As per the earlier definition, a power project could be declared as commissioned even when it is simply synchronized on oil, well before the completion of other stages like synchronization on coal, full load operation, trial operation and finally COD.

The data shows that while the target for hydro capacity addition of 1,008 MW for the 12-months period from April 2008-March 2009 has almost been achieved, the targets for thermal and nuclear power capacity addition have seen huge slippages. Of the total thermal power capacity addition of 9,304 MW targeted in the period, only 2,484 MW - about 27% have been added. But the target for the nuclear capacity addition of 440 MW which was to be

added by the commissioning of the Nuclear Power Corporation's Rajasthan Atomic Power Plant unit-5 and 6, has been missed completely.

Most power projects have been held up in a knee-jerk reaction to the global liquidity squeeze as companies wanted to evaluate the likely demand scenario after large banks collapsed and a recession scenario was starting global economy. Even where financial closure had been achieved, work had been stopped as the promoters were unsure about the feasibility of the projects. However, over the past two months, the situation for the power sector hasn't deteriorated, industry executives said.

This dismal addition in the country's power generation capacity comes at a time when there has been an increase of around 1,000 MW in the overall demand for power in the same period. However, the deficit in the peak time power availability in 2008-09 has decreased to 12% from the 16.6% recorded in the previous year. The gap in generation had also forced the Power Ministry to plan and review projects for speedy execution. According to Power Ministry estimates, the current Five-Year Plan has added 12,000 MW, which is lower than what is expected from the industry. Projects that would generate over 88,000 MW are under construction through various companies.

However, sustained efforts to boost private sector investments in the power sector seem to be finally paying off. Most recent numbers show that installed capacity of the private sector has grown faster than the government sector (state and central) in the first two years of the 11th Plan. While the installed capacity of the private sector shot up by 32.8% in the first forty seven months (up to February 2009) of the 11th Plan that of the central and state governments rose by just 8.5% each. Figures available till February 2009 show that the private sector added 5,592 MW of capacity in the Eleventh Plan while the State Sector could install only 5,944 MW and the Central Sector just 3,850 MW.

Thermal

There is unlikely to be any respite from power shortages, with the Center's power capacity addition targets clearly fizzling out and key utilities facing slippages. NTPC, which has been central to the capacity addition programme over the years has been considerably slow in the start-up years of the current Plan and has managed to commission just 1,000 MW in 2008-09, as against a target of 2,800 MW.

Other than NTPC, NLC and DVC have also reported slippages in some of their projects. Besides this, the nuclear capacity addition of 440 MW during 2009-10

Power capacity addition vis-à-vis demand for past 5 years (April 04 - March 09)			
	Capacity addition (MW)	Power demand (MW)	Deficit (%)
2004-05	3,948.9	87,906	11.7
2005-06	3,468.8	93,214	12.3
2006-07	6,852.8	1,00,715	13.3
2007-08	9,263	1,08,866	16.6
2008-09	4,924 *	1,09,809	12.0

* The figure with changed definition of commissioning will be 3453 MW.

through the commissioning of NPCIL's Rajasthan Atomic Power Plant unit - 5 and 6 has been missed completely.

Going by the performance so far, NTPC has managed only 12% of the capacity addition target of 22,400 MW, set for the current Plan, even as 40% of the five-year period has elapsed. NTPC is yet to order equipment for around 8 % of the planned capacity addition and slippages are likely to continue. According to CEA, NTPC is projected to add 15,700 MW capacity by 2011-12, a likely shortfall of 6,700 MW. In the light of slippages in the last fiscal, NTPC now hopes to add 3,300 MW in 2009-10, as against a lower target of 2,800 MW set earlier.

Reliance Power's 4,000 MW ultra-mega Sasan power project has achieved financial closure, the second such project to achieve a legally binding commitment of equity holders and debt financiers. The government will award three more Ultra Mega Power Projects of 4,000 MW capacity each in the next financial year and is looking at the states of Tamil Nadu, Orissa and Chhattisgarh. As of Feb 2009, 13 UMPPs have been planned in Karnataka, Chhattisgarh, Madhya Pradesh, Andhra Pradesh, Maharashtra (2), Orissa (2), Tamil Nadu (2), Gujarat and Jharkhand. The Power Ministry is also evaluating the proposals to plan at least one UMPP for each state, and the government may give one ultra mega power plant with a generation capacity of 4,000 MW to every state after the state government's evinced overwhelming interest in the scheme aimed at cutting down electricity deficit. However, before including all states in the UMPP plan, the Ministry has to evaluate many things primarily fuel and water availability.

Equipment shortages

The power sector growth story has been hampered by a dire shortage of key players - from equipment suppliers to contractors. Fresh power capacity addition has fallen short of target by over a half in the year 2008-09, because of the delay in supply of critical components in thermal projects and non-availability of fuel. According to the latest data provided by the CEA, only 4,900 MW, or 44% of the targeted addition of about 11,061 MW, was achieved in the twelve months ended March 31, 2009.

The government targets power generation capacity in excess of 78,500 MW during Eleventh Plan. A large portion of this capacity would be super critical. There are very limited players who supply power plant equipment.

The sector is open to 100% foreign direct investment under the automatic route, and current guide-lines governing power equipment manufacturing do not have any provision to stop fly-by-night operators. The government is likely to stipulate a seven-year lock-in period for foreign companies setting up manufacturing facilities for new generation power equipment to discourage non-serious players.

The tenders would also make it mandatory for all interested companies to get technology transfer agreement in place before bidding begins. Moreover the companies winning in the bulk tendering will have to adhere to a phased manufacturing programme with monitoring of milestones and levels of indiginisation achieved.

A typical project, which has funds tied up and could be commissioned in 32 months is taking a minimum of 46 months now under these circumstances. There has been delay in commissioning of many units as Balance of Plant equipments are not ready. Unavailability of BoP equipment alone has caused slippage of around 4,000 MW in the year. Of the total 513 BoP equipment required for the power projects under construction to achieve the capacity addition target of 78,700 MW in the current Plan period, orders for 121 or 24% are yet to be placed as per the data provided by CEA. There are just a couple of BoP players in the country. As a result, power plants are not getting commissioned and have to wait. Even in coal or ash handling there are just a couple of companies. The net result has been just an addition of 10,000 MW in the past five years, against the demand of at least three times that figure.

Renewable Energy

Indian wind power producers have added nearly 1,500 MW of wind power capacity in 2008-09. Better tariffs, policy support and optimistic outlook

continued on page no. 126

continued from page no. 48

are driving investments, say industry representatives. The total installed capacity in India is 10,134 MW as of March 2009.

To encourage renewable energy production, the government may make it mandatory for power distribution firms to also supply power generated from renewable sources. CERC is working with state regulators to take penal action against distribution companies who fail to comply with the norms. The proposed move will ensure that every state reduces consumption of conventional power by certain percentage and encourages generation of power from renewable sources such as wind, solar or biogas. Cost of producing renewable power and the lack of uniformity in renewable power tariffs are major reasons for the gap that exists between demand and supply of grid-interactive green power.

Even though power companies are capable of producing renewable power, most of the time they are unable to feed into the grid because it is commercially unviable. The states are now trying to address this problem as they have to meet the demand for energy.

Demand supply gap

For the first time since 2002-03, growth in power generation slipped below the 3% mark last fiscal due to tardy progress in project implementation by state, central and private operators, as well as an acute shortage of feedstock, especially coal. This has led to an increase in the gap between supply and demand to double digits for the first time since 2002-03. However, the peak-hour deficit has come down drastically, mainly due to improvement in plant load factors, especially by private sector generation companies.

According to the Ministry of Power, against a target of 774.1 billion units in 2008-09, actual generation was only 723.6 billion units, which translates into 93.4% of the target. This is a significant setback as generation growth came down to 2.7% in 2008-09, compared with 6.3% achieved in the previous fiscal. Even since 2002-03, growth in power generation was well above the 5% mark, with 2006-07 showing a peak growth of 7.3%.

The slippage in generation also widened the gap between availability of power and demand to 11% in 2008-09. This is also a major reversal as the power deficit was always kept under 10% from 2002-03 to 2007-08. However, there has been a steady increase in power shortage since 2002-03, with the figure hovering between 7% and 10%.

Peak-hour shortage declined in 2008-09 to 12%, compared with 16.6% in the previous fiscal. From 2002-03 to 2006-07, the peak deficit was confined below the 14% mark. There is, however, some good news amid the gloom with plant load factors showing a remarkable improvement since 2002-03 with an achievement of 77.19% in 2008-09, against a target of 79.17% set by the Ministry.

The latest figures suggest a worsening of the power scenario, pan-India. The setback calls for focused proactive policy to boost availability and shore up the quality of power. According to the Central Electricity Authority peaking shortages have risen to 13.2% in February, up from 12.3% in the previous month.

Transmission

The 11th plan has accorded high priority to the inter-regional transmission highways to be developed by 2011-12. Setting up of a strong National Grid will help tide over the regional imbalances in power surplus/deficit areas. The enhancement of the generation capacity has necessitated development of a national grid which can bring about a balance in peak demand across regions and reduce the mismatch between demand and supply. The transmission system has thus shifted from regional level to national level. The interregional power transmission capacity is likely to increase from 18,700 MW currently to about 37,700 MW at the end of the eleventh plan. These highways are proposed to be established in phases matching with the requirement of inter-regional power transfer. The enhancement of inter regional capacity to 37,700 MW by 2012 would require adding of over 60,000 ckt kms of transmission network with an investment Rs 55,000 Crore.

An investment of about Rs. 10,64,000 crore has been envisaged toward generation capacity addition and creation of T&D systems during the Plan period that ends in March 2012. The fund requirement for the transmission sector would be around Rs 140,000 crore. Out of this, Rs 75,000 crore was estimated under the central sector and remaining Rs 65,000 crore under state sector.

In order to meet the T&D system requirement for evacuation of a capacity addition of 78,700 MW in the XI Plan, several high capacity transmission corridors are required. In addition, many independent power producers have applied to grant long term open access to transmission. The task ahead is gigantic as by the end of current plan, the transmission network is planned to be enhanced to about 300,000 circuit km.

The Transmission systems associated with the 3 Ultra Mega Power Projects Sasan, Mundra and Krishnapattanam have already been finalized and bid out. The award process for the 4th UMPP at Talaiya (Jharkhand) has also been completed and the associated transmission lines are expected to be finalized soon. Three new UMPPs of 4,000 MW could be set up in Cheyur (Tamil Nadu), Tadri in Coastal Karnataka and Giriye in coastal Maharashtra.

As far as transmission schemes for the upcoming ultra mega power projects (UMPPs) are concerned, the Centre proposes to bifurcate such schemes in two or three parts, where one of the parts will be offered through a competitive bidding route to the private sector. Such a move is considered in the case of the UMPPs of Sasan, Mundra and Krishnapattanam.

Currently, Powergrid is involved in the completion of the national transmission grid with an inter-regional transmission capacity of 37,000 MW by 1212. It has already completed the work on around 20,000 MW capacity so far, and has planned a capital expenditure of Rs 12,000 crore for the current fiscal year, much higher than the Rs 9,000 crore spent in the previous year. Powergrid will invest around Rs 55,000 crore for laying new transmission network in the country by the end of 11th Plan. However, it may not be able to fully utilize this Capex due to delays in setting up some of the hydro and ultra mega power projects.

Right of way and land acquisitions are major hurdles in the development of transmission system especially in the urban areas. There is a need for a mechanism and action for acquiring and reserving transmission corridors for future transmission projects, especially in chicken-neck areas for the transmission of power from the north east region projects to other parts of the country. In order to reduce the RoW and meet the future bulk power transfer requirement from various generation projects, latest technologies will be needed. Besides, there is also a need to simplify the procedures for forest clearances.

The Centre, in a serious-bid to encourage private sector participation in power transmission sector, is proposing to rework a new bidding process that aims at cutting down the time of bid invitation, evacuation and placement of the letter of award. The schemes to be commissioned during the 12th Plan (2012-17) and implemented through the private sector would be firmed up and identified in advance in order to avoid any delay in implementation.

Equipment testing facilities

India's ambitious plans to ramp up its power generation capacity multi-fold to cope with the average 14% annual increase in the demand for power will require commissioning of higher-class transformers. The unavailability of a testing facility for transformers can severely impact the transmission targets for the current Plan period.

At a time when the demand for power in India is projected to rise to 1,000 billion units by 2012, as against 730 bus at present, the country does not have a higher-range testing facility for power equipment like transformers. Manufacturers have to send their equipment to KEMA; the Netherlands based electrical equipment testing organization for testing. This leads to an average delay of 5-9 months in the commissioning schedule of transmission projects where transformers form an integral part of the system.

India plans to triple its inter-regional power transmission capacity in the current Plan period ending March 2012. In an attempt to cut down the delays in power projects caused by the lack of a proper equipment testing facility in India, the Power Ministry has got four PSUs to form a joint venture to setup domestic testing laboratory with a investment of Rs. 200 cr. NTPC, NHPC, Powergrid and DVC will contribute equally in the venture. With the new testing facility coming up soon, the Ministry expects to fast-track its plans for laying down adequate transmission infrastructure with the help of the four PSUs. India's only testing facility at the CPRI can only be used for routine testing of transformers.

National Electricity Fund

The Planning Commission has proposed setting up a National Electricity Fund with a corpus of Rs. 1,00,000-Rs 1,50,000 crore to finance development of power transmission and distribution network by state utilities so as to reduce T&D Losses. The idea behind setting up this fund is to reduce T&D losses in the next three years to 15% by setting up new electricity transmission lines, transformers, replacing over-loaded lines and using new technology.

PFC and REC will be the nodal agencies to finance state utilities. The agencies will raise around Rs 30,000 - Rs 40,000 crore every year from the domestic market and financial institutions. The government will help the agencies through interest subvention.

Distribution Reforms

The government may finally complete its six-year old initiatives to unbundle state electricity boards into separate entities for power generation, transmission, distribution and trading business by June 30 this year. Seven states that are yet to unbundled - Kerala, Tamil Nadu, Bihar, Jharkhand, Punjab, Himachal Pradesh and Meghalaya- have been given what is being called final deadline to unbundled. Though many deadlines have been breached in the past, this date is likely to be kept by the seven states.

Unbundling by itself is no solution, and has to be accompanied by internal reforms to make it effective. It has to be accompanied by good corporate governance. There are examples of states where even after unbundling; the results have not been satisfactory. Planning Commission has called for efficiency rating of the Electricity Regulatory Commissions in the states. Though the ERCs have been functional in most states for years the finances of power utilities have actually gotten worse. The way ahead is to mandate much more disclosures and performance measures in power. What's called for is purposeful use of information technology and expert systems to track sectoral performance. Concurrently what is required is corporate structures in state power utilities to rev up transparency and operational efficiency. In parallel equally needed is a proper market for power, so that efficient power producers and suppliers can seek custom in real time. This would call for open access of line capacity, reasonable wheeling charges and the like. Otherwise the future would be rather dim indeed.

Rural Electrification

Rajiv Gandhi Grameen Vidyutikaran Yojana was launched in April-05 by merging all ongoing rural electrification schemes. The scheme aims at electrifying all villages and habitations as per new definition, providing access to electricity to all rural households and providing electricity connection to Below Poverty Line (BPL) families free of charge.

Continuation of RGGVY Scheme of Rural Electricity Infrastructure and Rural Household Electrification had been sanctioned in the XI-Plan for attaining the goal of providing access to electricity to all households, electrification of about 1.15 lacs un-electrified villages and electricity connections to 2.34 crore BPL households by 2009. Approval had been accorded for capital subsidy of Rs 28,000 crore during the Eleventh Plan period.

As on 31.03.2008, works had been completed in 47826 un-electrified Villages, intensive electrification works had been completed in 40838 already electrified villages, free electricity connections were released to 22.93 Lacs BPL households, various types of franchisees deployed in 75368 villages and construction of 130 new substations were completed.

As per available statistics on the progress of RGGVY implementation as at the end of April 09, out of approximately 118000 un-electrified villages, about 61000 villages have been electrified, amounting to achievement of 51% of the target. In case of intensive electrification, works in about 82000 out of targeted 3.5 lac electrified villages have been completed. However, in case of providing connections to rural households, including BPL, a little over 16% of the targeted 4 crore + households have been connected. Likewise, connections have been provided to about 24% BPL households out of targeted 2.45 crore by the end of April 09.

The performance of RGGVY in some States has been slow because of the various reasons such as delay in receipt of Detailed Project Reports, finalization of BPL lists, forest clearance, land acquisition for 33/11 KV sub-stations, limited number of good agencies available for execution of turnkey contracts, issuance of Panchayat Certificates for village electrification and lack of awareness among villagers for taking new connections. For effective implementation of RGGVY, the government has taken number of steps. Chief Ministers and Chief Secretaries of State Governments have been requested to constitute Coordination Committee to address state level issues for expeditious implementation of the scheme.

APDRP

In spite of years of power sector reforms, seven states have not yet unbundled their respective SEBs as mandated by the Electricity Act of 2003. Even the states that have unbundled their SEBs have not been able to achieve the subsequent milestones, most importantly a reduction in AT&C losses. Nation-wide such losses are still well over 30%, and in many states in the range of 40-50%, even as the central government has provided nearly Rs 40,000 crore in grants and incentives to states over the tenth plan through the APDRP.

The key issue is that the bulk of AT&C losses are actually power thefts. And the vested interests are so well entrenched that distribution transformer metering, which can help curb electricity theft, has

not been implemented in many states. By March 2008 only three states had achieved 80-100% DT metering. So in many states the gap between average realization and average unit cost has only widened, leading to even bigger losses. At some stage, states would again be unable to meet their power dues, which would cause hardship all around and derail the momentum on the generation side. The incentive approach has not worked as evident from low utilization of this aspect of APDRP which requires SEBs to reduce cash losses. The larger power reform clearly requires a wider political consensus. States like Gujarat have shown that it is possible to reform the power sector without losing votes. The cost of providing free power to farmer is so low that if the state governments were to curb theft they would have enough electricity to spare for all the vote banks without compromising the viability of SEBs.

The Government has recently approved the continuation of Accelerated Power Development and Reforms Programme during the 11th Plan with revised terms and conditions as a Central Sector Scheme. The focus of the programme will be on actual, demonstrable performance in terms of loss reduction. Establishment of reliable and automated systems for sustained collection of accurate base line data, and the adoption of Information Technology in the areas of energy accounting are the necessary pre-conditions before sanctioning any projects for strengthening and up-gradation of sub- transmission and distribution networks.

Projects under the scheme are to be taken up in Two Parts. Part-A is to include the projects for establishment of baseline data and IT applications for energy accounting / auditing and IT based consumer service centers. Part- B includes regular distribution strengthening projects. Initially funds for projects under both parts shall be provided through loan. Government of India will provide the permissible grant money as and when it becomes payable. The entire amount of loan for Part-A projects is to be converted into grant once the establishment of the required Base- line data system is achieved and verified by an independent agency appointed by the Ministry of Power. Up to 50% (90% for special category states) of loan for Part-B projects is to be converted into grant on achieving the 15% AT&C loss in the project area.

The Utilities are also to achieve the target of AT&C loss reduction at utility level. Let us hope the Restructured APDRP will achieve what the earlier reform programs have not been able to do for the power distribution sector.

Conclusion

It is quite evident that there will be a slippage in the capacity addition in the 12th Plan also , let alone 11th Plan due to the delays in hydropower projects. Planning Commission has initiated a process of mid-term review of the 11th Plan (2007-12) which assumes importance as the ambitious plan seeking to raise the gross domestic product to 9% was hit by the global financial meltdown, which, as per the RBI estimates, has pulled down the economic growth to 6.5 to 6.7% during the fiscal 2008-09, down from 9% a year ago.

The silver lining in such a scenario is that with credit markets likely to thaw soon, fuel costs down sharply from their highs and gas from Reliance's Krishna-Godavari basin beginning to flow, more power projects are likely to take off soon. What could, however, queer the pitch is the lack of reforms in the distribution sector.

In the beginning of every Plan period, the government sets huge targets, but suddenly it announces a shortfall down the line. There's a large and growing investment back log and the supply situation seems to have deteriorated. The heightened power shortages of late - especially amidst the current deceleration in the economic growth momentum when electricity demand can normally be expected to ease - point towards systemic rigidities. The financial performance in the state-dominated power sector has never really improved, despite almost two decades of reforms and opening up, which is the most worrisome aspect for this most crucial infrastructure sector for the nation at this point.

That the power capacity addition in the Eleventh Plan (2007-2012) is going to be well below the targeted 78,700 MW is clearly on the cards. Whereas 40,000MW is certainly achievable, 60,000MW is a possible target. But 77,000 MW looks a remote possibility. During the 8th, 9th and the 10th Plan periods 56,000 MW were added. But in this 11th plan, 92,000 MW is targeted to be added, including captive, which has never happened in the history of the country.

However, with stable Government in the Centre now, IEEMA hopes it will continue with the ambitious programmes in power sector, like promotion of nuclear power, and overall economic growth.

Article compiled based on reports of Ministry of Power, CEA & newspaper reports.



J Pande
IEEMA, Delhi