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Confederation of Indian Industry

INFRASTRUCTURE AND GOVERNMENT

Power Summit 2009

Meeting the Goal of Power for All

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Enabling Speedy Capacity Addition in Power Sector

Steps towards meeting the vision of 'Power for All' by 2012

Power is a critical infrastructure in today's time and over the past few years, the Government of India has strived hard to meet the demand for this basic requirement of its people. Post the Electricity Act, 2003, which provided an enabling framework for accelerated and more efficient development of the sector – significant reforms have been witnessed till date. Section 3(1) of the Electricity Act, 2003, required the Central Government to formulate the National Electricity Policy (NEP), in consultation with other stakeholders. Accordingly, the NEP was released in February 2005, and aimed at providing 'power for all by 2012' – an ambitious target given the state of the sector and the utilities operating at that time. Today, after years of reforms in the power sector the country is still far behind its ambitious goals – with over 1 lakh villages[1] still not having electricity connection and the peak load deficit at 13,124 MW (on an all India basis for FY 2008-09)[2]. Thus, this is the time to analyse the key issues and the measures and steps required so as to achieve the vision of 'Power for All by 2012'. Key current and potential future issues/ bottlenecks of the various segments of the sector have been identified and analysed below.

1 Progress report on Village Electrification as on 30-06-2009, Ministry of Power website
2 CEA Report, Power Scenario at a Glance, July 2009

Generation

Peak load capacity deficit

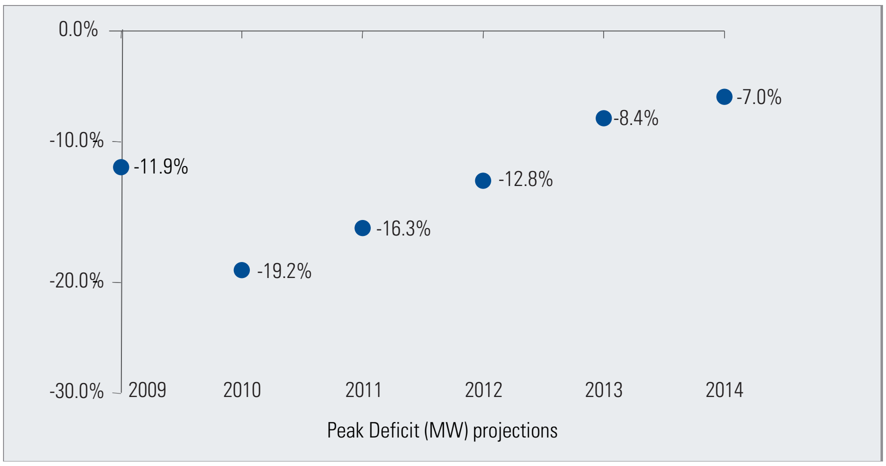
The energy and peak power deficit in the country has been estimated at close to eleven percent and fourteen percent respectively, with Northern and Western Regions witnessing even higher deficits.

Region	Energy (MU)	Deficit (%)	Peak	Deficit (%)
	Requirement		Demand (MW)	
Northern	24,369	-13.6	35,932	-15.7
Western	20,990	-12.6	35,503	-19.6
Southern	18,465	-6.4	28,387	-8.4
Eastern	8,091	-6.5	12,829	-7.0
North Eastern	844	-12.9	1,760	-22.2
	72,759	-10.7	114,412	-14.2

Source: CEA Generation Monthly Report, Aug 2009

Inability to meet peak-load demand has led to prolonged hours of load-shedding faced by the consumers and procurement of power from short-term markets at very high rates (nearly INR 7[3] per Kwh) by the utilities during these periods. The government focus on additional generation capacity development has resulted in many private players setting up base load power plants indicating essentially the persistence of peak load deficit going forward.

As per KPMG in India's analysis related to projection of generation capacity addition under various scenarios and considering 16th EPS figures for energy and peak demand, it is anticipated that while the off-peak deficit situation is expected to ease to a fair extent and could potentially even become supply adequate; peak deficits may continue going forward.



Source: Power Summit 2009: Meeting the Goal of Power for All

3 As per CERC, weighted average price of short-term transaction of electricity was 7.31 in FY 2008-09

This analysis essentially highlights the need for adequate focus on peaking capacity creation and promotion of optimal mix of generation capacity between base-load and peaking plants including a favorable hydro-thermal plant mix. Some of the key areas requiring focus for promotion of hydro-power generation are:

- Different states follow different criteria[4] to award hydro projects adding to confusion and delay in hydro capacity development. Hence, transparent national level guideline/ policy is required for uniformity in awarding of hydro power generation projects.
- Land acquisition has been one of the key bottlenecks in the development of power projects. State Governments need to develop equitable Rehabilitation & Resettlement (R&R) policy and provide support for transparent implementation of the R&R package.
- Normally it takes 1 – 1.5 years to secure the environment and forest clearance for the project, hence definite time-lines need to be specified for providing different clearances from State and Central Government departments.
- State and Central Government need to focus on development of integrated organized database of geological information of different prospective hydro power generation sites. It should help reduce the chances of geological surprises and time period for project development.
- As hydro power generation projects usually have large development period and take 4-7 years of construction period, there is a need for development of debt market enabling lending for long-term generation projects. It should promote more investments into hydro power generation.

Equipment supply

According to the CEA data[5], against the target of 78,700 MW, only 12,717 MW has been commissioned in the XIth plan period (FY 2008-12)[6] so far. One of the key reasons for delay is due to longer delivery time of plant equipments by the suppliers. As per CEA[7], of the 67, 293 MW generation capacity under construction; EPC and BoP related factors accounted for majority of delay in project implementation. BHEL, key supplier of power equipments in the domestic market, has capacity to produce only 10,000 MW each year (Though it is planning to ramp its capacity to 15,000 MW by end of 2009)[8]. The company order-book to turnover ratio of greater than 4 for FY 2008-09 indicates long time period for delivery of generation plant equipment by this supplier.

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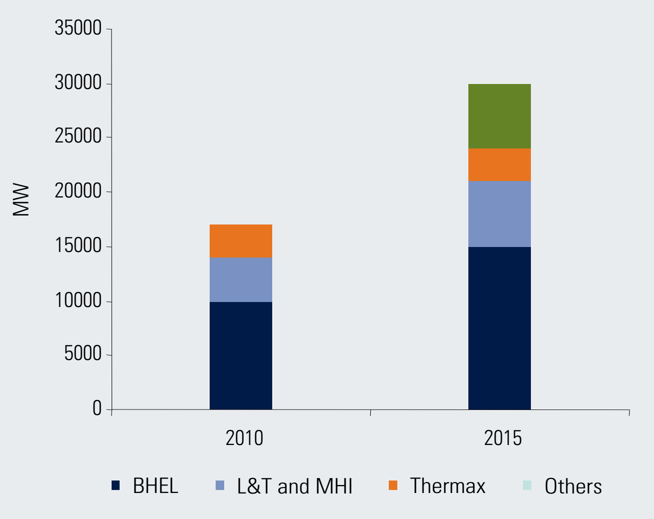
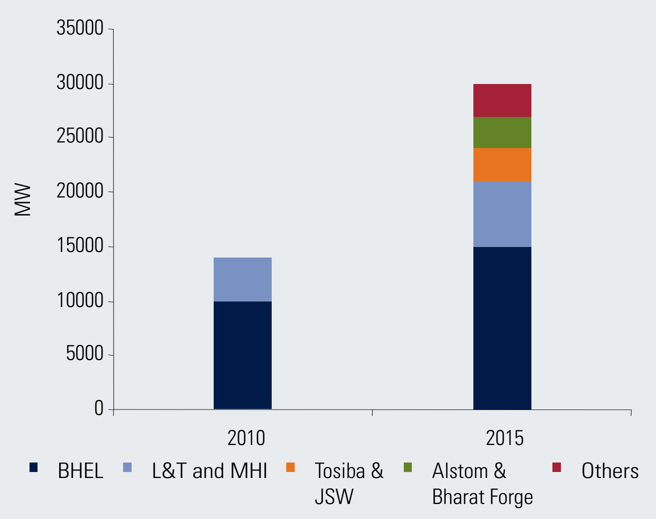
4 Various parameters such as upfront equity, share of free power, cash-less equity stake in the project, competitive bidding are key criteria for award of hydro power
5 CEA website; www.cea.nic.in; Project Monitoring section
6 Thermal: 8105 MW; Hydro: 3393 MW and Nuclear: 220 MW; Source: CEA
7 CEA website; www.cea.nic.in; Project Monitoring section
8 BHEL financial statement for FY 08-09

Many private players have also entered into equipment manufacturing space in joint ventures with foreign players for technology inputs. Such capacity addition needs to be encouraged through favorable policies to meet the growing demand from the power sector.

Boiler and auxiliaries capacity



Turbine and generator capacity



Source: Infraline

Apart from costs[9], the time-frame for additional manufacturing capacity commissioning and impending huge order book size are some of the key reasons for various project developers to look at import of equipments from countries such as China, Korea etc. Of forty-three supercritical units bought by Indian companies so far, orders for only four have been placed with Indian companies. Chinese companies have bagged orders for twenty six boiler–turbine–generation sets (BTG). Koreans managed eight, while three went to Russian companies and two to Italian firms[10]. However, there have been some concerns raised relating to suitability of these equipments in the Indian environment.

Generation project developers need to identify the equipment supplier considering not only the competitiveness of the price offered but also the reliability of delivery and quality assurance of the equipments supplied. Additionally, developers need to set-up formal teams for identifying in advance any likely delays in the supply of the main and BoP plant equipments from the equipment supplier(s) and initiating appropriate mitigation mechanisms for the same.

9 As per KPMG in India's analysis Chinese equipment supplies are 10-20 percent cheaper than Indian manufacturers
10 Internet search from financial chronicle news article

Issues in fuel supply

Transparent and speedy process for coal allocation

The Minstry of Power (MoP) in order to facilitate capacity addition through Merchant Power Plants (MPPs), has been coordinating with the Ministry of Coal to identify coal linkages (for 1000 MW plant) and coal blocks (for 500 - 1000 MW plant) for allotment to such plants[11]. However, the framework for such fuel allocation is yet to be notified and this uncertainty is causing delays in plans for new capacities.

Improvement in mining efficiency

The demand for coal has been increasing at the rate of 8-9 percent per year[12] while Coal India limited production has grown at the CAGR of 5.7 percent over the last 5 years[13]. In order to increase its production, Coal India should need to invest in new technologies (for both under-ground and open cast mining), process improvements for planning and execution of projects, and institutionalize a comprehensive risk management framework with a plan to match international productivity levels. As a step in that direction CIL should look at technology transfer arrangements through mechanisms such as joint ventures with technically advanced mining players for coal mining. The organization should also encourage competition among its various subsidiaries for efficient production and provide them support for introduction of newer technologies.

Fuel transportation

The failure of transportation infrastructure to keep pace with growth in coal production has been causing problems in timely supply of coal to generating stations. According to the internal assessment by Coal India Limited, lack of freight corridors and feeder routes has hindered transport logistics[14]. Delays are created because freight trains get a lower priority than passenger trains. Additionally, supply of coal during the fair-weather period of November to March to power stations has been a problem as railway wagons during this period were mostly used to ship fertiliser for Kharif and Rabi crops. Since last couple of years, substantial generation capacity has been planned based on imported coal hence transportation infrastructure for the same needs to be developed in a timely manner.

11 Ministry of Power website; R.V. Shahi paper on "India's strategy toward energy development and energy security"
12 Infrastructure Today magazine, August 2009
13 Coal India Limited website
14 Business Standard article "Coal India blames infrastructure for supply problems" January 2008

In order to increase freight capacity from the coal-producing regions (central and eastern India) to the demand centers in the northern and central parts of the country, it is necessary that Indian Railways augment capacity. Special freight corridors are required to enhance speeds, cut costs, and increase the system's reliability. In order to cater to prospective increasing supply of imported coal, State and Central Governments need to work together to identify potential projects for green-field and brown field port capacity development including the evacuation infrastructure at key locations along the eastern and western coasts.

Transmission

Uncertainties in availability of transmission system capacities had been a concern for some of the Merchant Power Plants who are not sure of their customers. Significant portion of new capacity is coming in the coal belt states while the demand centers are in the Northern and Western regions of the country. According to the PGCIL, planned incremental inter-regional power transfer capacity will be 19,000 MW by 2012[15]. Building this out in a timely manner is critical for the power market to function effectively. Till date only two projects have been awarded to the private developers[16].

Government of India needs to continue to take steps to speed up the process of augmenting the transmission network in India. The MoP has now issued draft Standard Bid Documents for selection of Transmission Service Provider. The MoP has also notified Power Finance Corporation and Rural Electrification Corporation to act as the Bid Process Coordinators to undertake bidding for few identified projects.

Project implementation delays

Key milestones like statutory clearances, land acquisition/ "Right of Way", EPC selection & order and project commissioning of integrated projects need to be monitored closely at the centralized level and any bottleneck should be resolved with active assistance from central monitoring authority. Recent reports suggesting Ministry of Power (MoP) has constituted a group of ex- Power Secretaries to monitor progress of power projects is a step in the right direction.

Use of better technology for efficient project implementation

Securing "Right of way" has been a key issue in transmission project implementation. Use of better technologies such as third generation technologies (FACTS – Flexible AC Transmission Systems) and new conductor technologies can help in achieving higher power transfer capabilities across the same Rights of Way (RoW). These technologies should be seriously explored by Indian power transmission companies.

15 Total inter-regional power transfer capacity of the PGCIL has gone up to 18,700 MW as on Dec 2008 and PGCIL plans increase the national grid capacity to 37,000 MW by end of 11th plan (Source: www.projectsmonitor.com)

16 Tala project was awarded to Tata Power and REL was selected to execute WRSS project. Source: Ministry of Power website

Distribution

Open-access as an enabler for capacity creation

Open Access implies that a buyer can choose his own supplier and vice versa and the buyers and suppliers would be entitled to the non-discriminatory use of transmission lines or distribution system for transferring power from generation to consumption points. Freedom and ease of getting open access down to the retail consumer level is a significant step towards moving to a fully competitive power market and this is expected to ultimately facilitate generation capacity addition. Today, merchant power developers have to depend largely on tenders issued by state utilities through the Case 1 route to tie up capacities through long-term contracts. This is essential for them to get comfort of minimum off-take and achieve financial closure. However, if the retail segment were to open up, then access to large customers would have provided an alternate option for tie-up on medium to long-term basis. Merchant developers could then be proactive in identifying buyers to make their projects viable rather than wait for tenders to be floated and procurement processes to be completed for setting up power projects. This may speed up capacity addition.

Most of the SERCs had fixed a timeline of end 2008 for opening up the distribution open access for consumers with connected load of less than 1 MW. Further, taking cues from the National Tariff Policy, a few state regulators have passed orders for reduction of cross-subsidy surcharge in the recent past.

State	Cross-subsidy Surcharge
Maharashtra	Rs.0.00/kWh
Delhi *	Rs.0.00/kWh
Gujarat	Rs.0.37/kWh

Source: Open-access orders of State ERC's
* - Only for Domestic category consumers

This is expected to promote open access as reduction in cross-subsidies will help maintain the attractiveness of a cheaper power source. Few regulators like the Maharashtra State Electricity Regulatory Commission have kept a zero level of cross-subsidy surcharge[17] so as to promote competition.

While the retail market represents a miniscule proportion of the power market currently, this is expected to increase going forward. As the demand-supply gap begins to narrow down, competitive advantage may begin to shift towards access to customers. In some states, this is likely to happen sooner. Generators and power players may do well through active planning to develop their capabilities and strengthening their presence in this area as the retail supply segment begins to open up.

17 Maharashtra Electricity Regulatory Commission website; Open-Access Tariff Order

Once we overcome the supply deficit and retail competition establishes in its true sense; i.e. freedom of choice, availability of products and information symmetry among consumers; the inflection point is expected to be reached. A well functioning power market can also go a long way in helping ensure that the prolonged history of power deficit in the country will not repeat itself in future.

Progress in open-access implementation is expected to boost investment in generation, transmission and distribution capacity development. Following initiatives/ focus areas may assist de-bottleneck open-access progress:

Implementation level initiatives:

- *Delay in decision with respect to open-access application:* There have been numerous instances of STU/ Distribution utilities taking inordinate time in according approval or rejection to the applications received for open-access. Absence of accountability being fixed by the regulator and strict compliance of the same allows concerned authorities to delay open-access implementation.

- *Notification of Intra-state ABT by state regulators:* Intra-state ABT helps ensure efficient energy balancing and settlement mechanism necessary to facilitate open access transactions. As per the compilation made by the Forum of Regulators (FoR), only 8 states have notified intra-state ABT[18]. Lack of credible balancing and settlement mechanism at the state level acts as a bottleneck for implementation of open-access.

- *Availability of sufficient transmission capacity:* The peak demand (in MW) is expected to reach a level of 1,52,746 MW by 2011-12[19] from the current level of 1,09,809 MW at the end of FY 2008-09.

Given that open access is critically dependent on the availability of transmission capacity both inter-region and within region, Central and State Governments need to plan and implement required transmission capacity addition in a timely manner.

Maximum Inter Regional Transmission Requirement (2014-15)		
Region	Requirement	Scenario
Nothern	13500 Import	Winter peak
Western	11000 Import	Summer peak
Southern	4000 Import	Winter/Summer peak
Eastern	25000 Emport (23000 MW - Own Gen. + 2000 from NER	Winter peak
North-eastern	4000 Export	Monsoon peak

Source: CEA website

18 Forum of Regulators' STATUS REPORT ON "ISSUES PERTAINING TO TARIFF POLICY", 2007-08
19 www.cea.nic.in ; Demand as per 17th EPS

Enhance planning and contracting efficiencies

Efficiency in planning is at the core of a successful timely and cost-effective infrastructure build-out. Planning has various elements to it:

- Designing of the right technical solution
- The optimal phasing and roll-out of the infrastructure plan and
- Choice of the right execution methods

Unfortunately, there seems to be a serious lack of focus on this area among the utilities, if one goes by the extent and level of resources assigned to this important task. Clearly, the need of the hour is to give this activity the highest focus. It would be worthwhile to remember that over 80 percent of the power infrastructure that will exist twenty years hence is yet to be built and efficient planning today will help us achieve that in an efficient way[20].

State utilities will do well to have a state level agency dedicated with the task of holistic planning at the state level. This should include planning related to fuel mix, generation location, transmission system and even choice of technology related to these areas. Also, important is to bring the element of environmental sustainability as an integral part of the planning process. Such an agency will also look at how the projects could be executed in the most efficient manner whether through private participation route or state utility route.

This would mean building significant capability within the designated agency to carry out this task. Adequate resourcing, imparting the right skills and setting up the planning processes for such an agency are necessary. The role of STU may be enhanced to play this important role.

The other significant bottleneck is the time taken to tender and award contracts. This applies both for projects to be executed through the PPP route or self developed projects by the utilities. A clear strategy to improve efficiency of the tendering and contracting process is urgently required. Utilities will do well to apply their attention to this important area and look at innovations and procedures to expedite this.

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