

All Charged Up and Nowhere to Go!

Since the advent of Electricity over one hundred years ago, it has become a critical life-force of modern day living. The unique features of Electricity – it cannot be stored, cannot be seen, nor touched, yet its effects are there for everyone to see. As something that the five senses cannot perceive, yet its effects are there for all to see, this bestows it with an ethereal quality and universal appeal.

It is in this context that even in the 21st century, the haves and have nots are clearly getting defined along the lines of those having or not having access to electricity. Electricity is becoming the index for defining the quality of Life and therefore the challenge before us is to ensure “electricity for all”.

Since 1991, the Government of India has consciously decided to move out of investment and management of infrastructure in India, especially the power sector. The IPP model that was adopted by India in the early '90s ultimately failed on both sides. As far as Government concerned, it failed to deliver cheap, economically-priced power when it was benchmarked to old, depreciated, existing power plants as the tariff from new power plants being proposed were much higher.

On the developers' side, the huge payment risk of dealing with a bankrupt monopsony and regulatory uncertainty culminating in the Dabhol fiasco ensured that there was very little investment coming into the power sector. Since the IPP experiment had failed to produce results on the one hand and the government had withdrawn from the power sector capacity addition programme, there was a huge gap between demand and supply which began to widen throughout the '90s and into the 21st Century.

With the coming of the Electricity Act, 2003, the Government of India came up with a strategy to tap the surplus power capacity available with captive power generating stations. However, the last few years have clearly shown that this attempt has not been very successful for various reasons. The Government of India and the Central and State policy makers are fighting to get all stranded power assets to inject surplus power into the grid in the national interest. However, there has been very little response from industry on this for various reasons; and listed below are some of the issues that are coming in the way of stranded captive power being injected into the grid in the national interest.

Challenges faced by Captive Power Plants

The first challenge for a captive power plant owner lies in the intricate and complicated scheduling procedures for injecting captive power into the grid. This is in addition to the fact that a captive power capacity has been primarily set up for the host industry and so for them to make an accurate forecast on a day ahead basis in 15 minute time blocks (as per the Scheduling Requirement) to meet the scheduling norms for which the management of this Industry does not necessarily have the necessary bandwidth.

To illustrate the point, let us take up a case study of a continuous process industry such as a melting shop which is using electric arc furnaces. Let us assume the arc furnace requires 10 minutes to load, 10 minutes to melt and 10 minutes to unload the molten metal. At the point of loading, the power required is 1 mw; at the point of melting the power required is 20 megawatts and at the point of unloading it reverts to 1 mw. If one was to assume that everything works like clockwork, then theoretically it is possible to predict on a day ahead in

15 minute time blocks basis and the time in which the unit will release 20 megawatts of power on to the grid. There lies the problem – as it is impossible to accurately predict the load profile on a day ahead and minute to minute, real time basis. Therefore, **the Government of India's policy should have approached the captive power policy as one for infirm power** and laid down policy regulations accordingly. All captive power is not treated as infirm power. Also, the UI mechanism is used for settlement of over and under draws on the grid posing a threat and a risk to the viability of the bilateral transaction of a plant injecting power into the grid. For example, it is possible that a captive power plant has signed a bilateral agreement at, let's say, Rs. 6 kwh per unit. However, **due to a mismatch in the schedule**, the unit actually ends up drawing power from the grid incurring a UI penalty at rate of Rs.9 per unit and thereby incurs a loss of Rs.3 instead of a profit. This is primarily due to the fact that the advanced scheduling system in 15 minute time blocks does not factor in the mismatch because of this minute to minute monitoring of the frequency. This illustration is a typical example of how, even though there are continuous process industries in the country having surplus power, they are not inclined to project surplus into the grid during times of shortage. All that is required is a change in the scheduling, dispatch and accounting procedure for infirm power. Until then thousands of MWs of power is stranded.

During moments **when the grid is under threat due to a supply-demand mismatch, it is the captive surplus which could come into play to inject surplus power into the system** in the short term. There is a discussion paper of the CERC which talks about settlement of transactions and carrying out bilateral transactions without scheduling. However, it is at a nascent stage and therefore has not yet been put into operation. This is indeed an indication of the need of the hour with regard to tapping captive power to shore up grid security during high demand periods.

Another stumbling block in captive power initiative is that the **capacity is predominantly based on liquid fuel and therefore the variable cost of these power plants are a major deterrent in scheduling bilateral transactions for trading surpluses** thanks to the volatility in oil prices. The price of oil has been escalating from \$9 a barrel in the 90s to \$150 in 2008 and has gone down to \$50 a barrel as of today and this has negatively impacted the ability and desire of captive power owners to inject power into the grid. A part of the problem lies in the fact that the UI rate which is supposed to be indexed to the price of diesel has not been allowed to do so for various reasons. For a long time the maximum UI rate was pegged between Rs 4-6 which was linked to the price of oil at \$ 35-50 a barrel of that time. It was only recently that it has been increased to Rs.10 per kwh which reflects an oil price of \$70 a barrel.

Now **this gives the wrong pricing signals whereby liquid fuel power based power stations do not get dispatched**. It is ironical that when there is a power shortage and there is a pressure on the grid, liquid based power plants do not get dispatched. So on the one hand there is a huge demand, and power cuts across the country hurting agriculture, industry and the economy as a whole, on the other hand there is power generating capacity which is ready for dispatch but not getting scheduled because of the artificial intervention in pricing of the UI settlement rate which is not sensitive to market pricing, demand and supply. The merit order system looks at the variable cost and does not take into account the fixed charges. So it is a self-defeating exercise not to allow market forces to send the right pricing signal. As a result there is a capacity of nearly 8,000-10,000 megawatts based on liquid fuel which does not get scheduled because of this peculiar problem, which may appear to be discriminatory since the captive power plant owners do not have the bandwidth to straddle their business

interests in addition to managing the day to day issues related to power scheduling and regulatory issues. Captive Power Plants are denied open access, subjected to state duties face numerous hurdles which discourage them from coming on to the grid more aggressively.

The 'J' Phenomenon

The next major issue is what I would like to call **the 'J' phenomenon**. As an illustration, there is a captive capacity of say, 30 megawatts which has been shut down deliberately by the industry for the simple fact that since the price of grid power is much cheaper than generated power, the fear in the mind of the captive power plant owner is that if he switches on his generating set, his allocation of power from the concerned SEB/DISCOM would get curtailed, thereby increasing his cost of energy and that of his product. Further, any minor profit he may have got from sale of surplus power would get offset by the much larger increase in his energy input cost, making his main production activity unviable. This is a genuine fear as various SEBs/DISCOMs have used their monopoly on to arm-twist the industry during times of power shortages.

The Problems of Open Access

Captive power plants are not being granted open access or third party sales by the state load dispatch centres who may, in most cases, be under instruction to try and capture the power within the state by pressurizing the captive power producers to sell within the state at a price much lower than what would be available to them if the power was exported outside the state.

Although State Load Dispatch Centers are supposed to function as independent entities, it has been found that since SLDCs are manned by officers of the State Electricity Boards, who are on deputation, they are susceptible to pressure being exerted on them through their parent organizations and officials of the state government which prevents them from functioning as independent entities. There are many ways in which open access transactions are frustrated by SLDCs. Some of them are: (1) The simplest way for not granting open access is to not respond to the request. So the moment the SLDC receives a request for open access, they do not respond. (2) The second way for SLDCs to refuse open access is to ask for an NOC from the State Electricity Board. This puts the entire issue of grant of open access into a loop and results in unending delay. Invariably, **the State Electricity Boards raise an objection stating that (1) there was an agreement with a generating company to sell power to the SLDCs or (2) the State is facing shortage and therefore the power should not be allowed to be exported outside the state**. This results in tremendous pressure on the surplus power generator who is then arm-twisted into agreeing to a lower rate for sale to the State Electricity Board since he realizes that his open access application is not going to be considered in the near future. Even if there is a response from the State Electricity Board, the SLDC is instructed informally to avoid giving open access. The SLDC then quotes **transmission constraints** as a reason for not granting open access. One interesting example was when a large mineral based industry was told that it should discontinue negotiations for sale of its surplus power with third parties at Rs.4 per kilowatt hour or else they would not receive black start power from the grid whenever their plant was down. This resulted in the industry selling the power to the grid for 95 paise per kilowatt hour and the grid then sold the captive power for a sum of Rs.7, making a super profit.

In another case, open access was denied by a State Government entity and the matter was referred all the way up to CERC but in spite of the CERC order, the concerned SLDC, on instructions from the local powers that be, refused to grant open access to a captive power plant having a surplus for sale to third parties. In some cases there are some State

Government policy constrictions which prohibit the sale of power outside the state, of any private sector captive power plant having surplus power, although the State Electricity utility is happily selling that power outside the state at a large profit.

In another instance, it was noticed that open access was denied purely on the basis of the whims and fancies and likes and dislikes of the State Load Dispatch Center, based on a prejudicial mind set against certain industrial houses and traders of power.

Possible solutions for Denial of Open Access for Captive Power Plants

The issue of denial of open access by State Load Dispatch Centres (SLDC) assumes significance because if the SLDC denies a generating company open access at any point in time then there is no alternative for the generating company to succumb to the pressure of the state or to shut off the plant.

This has been noticed as a new phenomena occurring in agro-based power plants which prefer to shut down rather than supply at a loss because of the huge escalation in agro-based fuel prices.

There is a possible solution whereby the regulations are changed once more wherein the nodal RLDC approves the transaction and coordinates with all the SLDCs for open access for captive power plants. In this situation in case of a denial of open access by the SLDC it may be possible if the industry has installed an SEM meter conforming to the requirements of the RLDC it can then inject power on the UI basis into the state grid. The RLDC then subtracts that quantum of power from the state account and the transaction is carried on from thereafter as a bilateral transaction on the basis of UI. In this option there is a customer who is willing to buy power at a bilateral price from the generating station and in spite of the non approval of the open access request by the SLDC the transaction is completed using the UI mechanism.

In other words the transaction from the generating company into the state grid is settled as a UI transaction, the transaction from the RLDC to the buyer is settled as a bilateral transaction or if the buyer agrees the UI transaction and the settlement between the generator and the buyer is done directly after the plus-minus of the UI charges versus the bilateral rate agreed and the account is settled. In a third option it is possible that if the industry has the necessary metering system which is RLDC compliant it can directly schedule the power to the RLDC through the state system and take this payment on a UI settlement basis directly from the RLDC. The CERC has come up with a very nascent concept paper on the subject but it has not moved forward.

ABT Settlement

All this does not augur well for the development of confidence in the Indian power sector by private investors. It must be emphasized that the Government of India has taken a conscious decision to move away from managing and monitoring infrastructure projects and it has wooed the private sector to come in and invest. In this context consumer choice and open access are great tools for de-risking merchant, independent and captive power generation investments and in this context this strategy of frustrating the private sector from getting third party open access is the single largest deterrent for private sector investments and in the negligible success of mainstreaming captive power.

The other set of issues which are connected to open access is the settlement mechanism for variation in generation. No state has an intrastate ABT mechanism in place; with a result that

the state utilities/discoms charge exorbitant temporary power tariffs for overdrawals by the captive power plant and, interestingly, pay them nothing for injecting surplus power into the grid beyond the schedule. The excuse given is that there is no intra-state ABT and therefore the generating company is bound by state policy and tariffs, even if the power transaction is interstate in nature.

What is Captive Power?

The Government of India, vide its various notifications, has been trying to remove difficulties in these projects and has defined the word “captive” through a notification laying out various criteria. Right in the middle of the controversy are the two words in the Electricity Act describing ‘primarily’ and ‘set up’. If you refer to a law dictionary on the interpretation of ‘set up’ then it reads as follows: “To raise” (ref: Black’s Law Dictionary)

This has created its own set of problems for structured finance and laying out the various rules of the game and therefore has undermined the spirit of the Act and the objectives of the Government in incorporating such innovative and revolutionary legislation. The Government has tried to clarify this vide its notification dated June 8, 2005 which states that captive means where the host owns 26% or more of equity and consumes 51% or more of power generated on an annualized basis.

There are a whole host of **issues which have been raised by the State Governments and the State Electricity Boards to create a disincentive for people to operate and run captive power plants**. Some of these issues are **parallel operation charges** to be paid by captive power plants which are synchronized with the grid. There are various sorts of standby grid charges which are also payable by captive power plants synchronized with the grid. The argument given is that sometimes these captive power plants, since they are synchronized, have a capability of absorbing and drawing large quantities of power from the grid and therefore should pay such charges. Besides this, certain state governments are levying an **electricity duty on captive generation** which adds a further disincentive to run these plants. There is a need for a uniform policy that needs to be framed and enforced across the country, which will facilitate the maximum amount of stranded power to come onto the grid. This will be beneficial for the sector keeping in view the slow addition to the generation capacities in the country.

Captive power plants for Special Economic Zones (SEZs) have become a new area of focus and attention. The rules of the game are such that they are not conducive to facilitation of Open Access transaction resulting in a large amount of capacity getting stranded, as Open Access is being delayed or denied resulting in a situation where capacity installed is not available due to bureaucratic fumbling on the one hand while the country starves for power on the other.

It is quite obvious that SEZs having set up their own captive power plant will have to wait for long for demand to pick up as various industries come up in the SEZ over a period of time. The question then arises, what should be done with the surplus power available in the interim period, especially keeping in mind that there is a deficit of power in the country. For various reasons, power supplies out of the SEZ will only result in a higher tariff for the consumer and therefore if blanket exemptions from any taxes/charges can be given for any power supplies out of an SEZ, these will be welcome.

According to rule 47 of the SEZ rules, surplus power from the SEZ may be transferred to the Domestic Tariff Area (DTA) on payment of duty of consumables and raw materials used for

the generation of power. However, even after payment of these duties, the proposal for this sale of power from the SEZ to the DTA has to be examined by the Development Commissioner in consultation with the State Electricity Board.

Further, the SEZ unit that intends to sell the surplus power to the DTA, will have to obtain permission from the Specified Officer and the State government authority concerned. Therefore, layers of bureaucracy are empowered to control the sale of surplus power from the SEZ to the DTA, even after the duties on raw materials used for the generation of power have been paid. This curtails market freedom and creates scope for arbitrariness on the part of authorities to stifle such transactions. [3]

The CII Model in Pune

The way forward for captive power plants to provide support to the grid in the short and medium term is indicated by what happens as **CII's Pune model where high cost power based on diesel/HFO was started by the captive power plants of industry during peak hours**, thereby relieving the grid of pressure during high demand periods and captive plants were compensated in the following manner: Cost of generation: Rs.11, minus Rs.5 which was the tariff of MSEB at the peak hours and Rs.6 per KWH was compensated by way of periodical reimbursements or adjustments in the industry's monthly electricity bill. The MERC, after giving the matter a lot of thought and after holding public hearings, was built to work out an arrangement and make sure that Pune did not have any power cuts on the one hand and the Maharashtra State Electricity Board (MSEB) could offset the additional cost for this power by way of recovery from the consumers of Pune an average of 30-40 paise per kwh.

The Road Ahead

It is therefore clear that **captive power plants which can be put to use and added on to the grid at short notice can do so provided the various bottlenecks created artificially by certain sections in the incumbent organizations are removed.** The way forward also includes a need in the UI rate to follow the oil price increases so that a tariff signal can be given to locally based stations, both captive and otherwise to schedule power during periods of shortage. This may allow the injection of roughly 20-30 thousand megawatts of power on to the grid which would give the grid security in the short to medium term.

There are a huge number of constraints and disincentives imposed on captive power plants by local authorities which need to be done away with. We need to **federalize the captive and private power sector** so that uniform rules can be made applicable to these projects across the country. These rules would particularly include uniform and low taxation on fuels, exemption from any local taxation in inter-state transactions, and a strong disincentive for refusing open access by state load dispatch centres. While the country waits with bated breath in darkness, this could be a quick way forward in meeting the power shortages in the near future.

The author is Director General Independent Power Producers Association of India (IPPAI) and can be contacted at harrydhaul@gmail.com

References used:

[1] Electricity Act 2003 - Part 1 Definitions 2 (8) “Captive generating plant” means a power plant **set up** by any person to generate electricity **primarily** for his own use and includes a

power plant **set up** by any co-operative society or association of persons for generating electricity **primarily** for use of members of such cooperative society or association”.

[2] *Black's law Dictionary*

[3] Insertions in the article based on SEZ opinion by Amarchand Mangaldas, are highlighted in grey.