



Ultra mega transmission needs policy boost



PHOTOS: STERLITE GRID

In 2006, the Union power ministry decided to involve private sector participation in setting up interstate and interregional transmission lines. This was done with a view to supplement the efforts of the Central transmission utility Power Grid Corporation of India Ltd that was till then the sole agency for developing interstate transmission infrastructure. It was also proposed to select developers using the tariff-based competitive bidding mechanism with a view to encouraging competition between private sector aspirants. Two Central PSUs under the power ministry – Rural Electrification Corporation Ltd (REC) and Power Finance Corporation Ltd (PFC) – were appointed as nodal agencies.

The process was novel in the Indian power sector. Not only was the presence of private sector in power transmission an unprecedented move but even the tariff-based competitive bidding mechanism was then in its early days. The process that was rolled out with four projects—two each entrusted to REC and PFC—got off to a very hesitant start. There was no worthwhile progress for around four years but the process did gather meaning and momentum subsequently.

In a typical project, PFC and REC award transmission lines based on the tariff (transmission charges) quoted by the developer. The developer so selected builds, owns, operates and maintains the project under the BOOM model for a concession period of 25 years, which includes three years of construction time.

As of mid-April 2014, the two nodal agencies were successful in awarding 17 projects, according to information compiled by *Electrical Monitor* from the respective nodal agencies, selected developers and government statistics. PFC has awarded eight of these projects while REC has finalized nine. Apart from this, there are at least four schemes coming up for award in the near future (See Box: *Schemes coming up for award*).

Sterlite Grid (part of the Vedanta Group) has been the most successful private sector developer with five projects under its fold so far. Reliance Power Transmission (part of Anil Ambani Group) has won two projects, both in the early days of the process; the company did not keenly participate in subsequent years ostensibly due to delays in commissioning those in hand. Essel Infraprojects (part of the Zee Group), a new entrant in the power transmission space, has won two projects. The Larsen & Toubro Group, through L&T Infrastructure Development Projects Ltd, has debuted in the power transmission development space through one project. Techno Electric Engineering Ltd has clinched one project. This Kolkata-headquartered company is already developing one intrastate transmission line in Haryana in joint venture with Kalpataru Power Transmission Ltd.

There has been only one case so far where an interregional project has been awarded to a consortium of private sector developers. The consortium in question is



Private sector participation in power transmission has been a contemporary philosophy that is beginning to take root. In this special story, **Venugopal Pillai** takes a closer look at India's success in developing sprawling and capital-intensive interregional lines through the tariff-based competitive bidding route. While nodal agencies Power Finance Corporation of India and Rural Electrification of India have been successful in awarding close to 20 projects, it has taken them much longer than anticipated to do so.

Early Glitches

Tariff-based competitive bidding for ultra mega lines (as they were referred to as then) got off to a hesitant start. The process was flagged off in late 2006 with bids invited for four projects, equally divided between the two nodal agencies REC and PFC. REC was entrusted with two schemes—associated respectively with the North Karanpura and Talcher-II power generation projects of NTPC. PFC was vested with the East-North Interconnection Scheme and another project associated with power evacuation of upcoming power projects (like Bokaro, Koderma, etc) of Damodar Valley Corporation (DVC). Both REC and PFC struggled to elicit response from private developers.

Readers would recall that this was around March 2007 when there was major controversy surrounding the award of the Sasan ultra mega power project. Tariff-based bidding, as a philosophy had come under a thick fog of controversy and skepticism. With awarding the projects getting elusive the power ministry even decided to scrap the tariff-based bidding route for one of the projects—the evacuation system associated with DVC projects, which was being handled by PFC. This project was critical as the power generation plants and the associated transmission system had to come up before the Commonwealth Games of October 2010. Accordingly, this project devolved on Power Grid Corporation of India. The shell company formed by PFC for this project, Bokaro Kodarma Maithon Transmission Co Ltd, was subsequently wound up.

It is equally interesting to note that the North Karanpura power transmission system that was being handled by REC also witnessed a change in scope. Certain urgent components of this project were entrusted to PGCIL, and the project with its scope curtailed subsequently was awarded to Reliance Power Transmission under the tariff-based competitive bidding route. The other REC project—Talcher-II transmission scheme—also went to Reliance. It is a matter of coincidence that both these projects are now struggling at the construction phase.

that of BS Ltd (formerly BS Transcomm), Patel Engineering Ltd and Simplex Infrastructures, which has won the rights to develop the 765kV Raichur-Solapur line straddling Maharashtra and Karnataka.

Here are details on some major players:

Sterlite Grid: This Sterlite (Vedanta) Group company has been the most successful private sector player in terms of securing interregional schemes from nodal agencies REC and PFC. It has so far won the rights to develop five projects. The very first project that it secured—the East-North Interconnection Project in March 2010—is also partly commissioned. One 400kV double-circuit line running 233 km from Purnia to Bihar Sharif was commissioned last year. However, the second component of the East-North interconnection, which is a line from Siliguri (West Bengal) to Bongaigaon (Assam) has been held up due to opposition from locals in Assam. Sterlite Grid, as part of the five projects

ULTRA MEGA POWER TRANSMISSION LINES AWARDED

Scheme	Agency	Selected Developer	Transfer
East North Interconnection Co Ltd	PFC	Sterlite Grid	Mar-10
Talcher II Transmission Co Ltd	REC	Reliance Power	Apr-10
North Karanpura Transmission Co Ltd	REC	Reliance Power	May-10
Raichur Solapur Transmission Co Ltd	REC	BS Ltd + Patel Engineering + Simplex Infra	Jan-11
Jabalpur Transmission Co Ltd	PFC	Sterlite Grid	Mar-11
Bhopal Dhule Transmission Co Ltd	PFC	Sterlite Grid	Mar-11
Nagapattinam-Madhugiri Transmission Co Ltd	PFC	Power Grid Corporation of India	Mar-12
Vemagiri Transmission System Ltd	REC	Power Grid Corporation of India	Apr-12
Kudgi Transmission Ltd	REC	L&T Infrastructure Development Projects	Aug-13
Vizag Transmission Ltd	REC	Power Grid Corporation of India	Aug-13
RAPP Transmission Co Ltd	PFC	Sterlite Grid	Sep-13
Patran Transmission Co Ltd	PFC	Techno Electric Engineering	Nov-13
Darbhanga - Motihari Transmission Co Ltd	PFC	Essel Infraprojects	Dec-13
Purulia & Kharagpur Transmission Co Ltd (ERSS VII)	PFC	Sterlite Grid	Dec-13
NRSS XXIX (B) Transmission Ltd	REC	Essel Infraprojects	Feb-14
NRSS XXIX (A) Transmission Ltd	REC	Power Grid Corporation of India	Feb-14
Unchahar Transmission Ltd	REC	Power Grid Corporation of India	Mar-14

in its mandate, is also developing the world's first 765kV double-circuit line that will run from Dharamjaygarh in Chhattisgarh to Jabalpur in Madhya Pradesh.

Reliance Power: This Anil Ambani Group company secured two mega transmission schemes in early 2010 from nodal agency REC. Both the transmission projects – Talcher-II and North Karanpura – are reportedly facing delays and are stuck for want of right-of-way. The two projects are together worth over Rs.4,000 crore and cover nearly 1,700 km across six states. By original plans, the 1,045-km-long North Karanpura transmission line, connecting Madhya Pradesh, Chhattisgarh, Uttar Pradesh and Haryana, was to be operational by November this year. The 592-km long Talcher-II transmission project, linking Odisha and Andhra Pradesh, was to be operational by October 2012. It is further reported that delays in the commissioning of these projects have put other inter-dependent lines in limbo.

Power Grid Corporation: Central transmission utility Power Grid Corporation of India Ltd (PGCIL) has been a key player in the ultra mega transmission projects awarded so far. PGCIL has clinched five projects as of mid-April 2014 and has been a key participant in the bidding process of nodal agencies PFC and REC. The entry of PGCIL as a “contender” for interregional transmission projects is very interesting indeed.

In around 2006, the Union government strongly felt the need for inducting private entrepreneurship in interregional power transmission lines, with a view to supplementing the efforts of the de facto agency PGCIL. Accordingly, the Centre embarked on the competitive tariff-based bidding mechanism for key transmission projects that formed part of the National Grid. The National Grid envisaging 37,500 mw of interregional transfer capacity between the five grids of India (north, south, east, west and northeast) was a project entrusted with PGCIL. The National Grid was the means to achieve the national objective of “One

Sterlite builds first ultra mega line



The first ultra mega power transmission scheme to get commissioned was the 233-km 400kV double-circuit Purnia-Bihar Sharif line in Bihar. Sterlite Grid Ltd won this project from nodal agency Power Finance Corporation under the competitive tariff-based bidding model. The SPV for this project is East North Interconnection Company Ltd. The Purnia-Bihar Sharif line is one of the two elements of the East-North Interconnection project, the other being a line from Siliguri (West Bengal) to Bongaigaon (Assam) via Kokrajhar (Assam). The Purnia-Bihar Sharif line transmission line traverses River Ganga and also passes through densely populated pockets in Bihar. The East-North interconnection project aims to bring hydropower from north east India and thermal power from eastern India to consumption centres in north India. Incidentally, the Siliguri-Bongaigaon line is currently facing problems relating to right of way in Assam. There has been intense rioting by people of the Kokrajhar region, opposing the project. The Central and state governments are looking into the matter and Sterlite Grid expects to tide over this impediment soon. (The “first” in this context refers to the period after formal guidelines on developing transmission lines through private sector participation were issued in 2006.)

Nation, One Grid, One Frequency.”

As tariff-based competitive bidding (TBCB) gathered steam, the Union power ministry made it mandatory that all “power purchases” be made using tariff-based bidding. This took effect from January 5, 2011. This is how PGCIL had to bid for interregional transmission lines and became a contender like any other private entity. The process of seeking private sector participation—in conjunction with the TBCB—has given rise to a situation where public and private entities are on equal footing and projects are awarded on the basis of tariffs quoted by the contenders.

Talking of PGCIL's role in the ultra mega power transmission series, it made its debut in March 2012 when it

won the transmission system associated with upcoming private power generation projects at Nagapattinam and Cuddalore in Tamil Nadu. The transmission system involves a 250-km 765kV single-circuit line between Salem and Madhugiri and a 250-km 765kV double-circuit line from Nagapattinam Pooling Station (Andhra Pradesh) to Salem. PGCIL clinched the project quoting annual tariff of Rs.98.702 crore. PGCIL has taken over the special purpose vehicle Nagapattinam-Madhugiri Transmission Company Ltd that will establish the system by March 2015. Subsequently, PGCIL won four other projects, including two recent ones in February and March 2014.

Much like other projects under

India's first case of private power transmission

In any study of private interregional power transmission lines, it is very pertinent to mention the Western Region System Strengthening Scheme-II, which is technically India's first interregional transmission system, fully owned by the private sector. This project, being developed by Reliance Power Transmission Ltd (part of the Anil Dhirubhai Ambani Group), evolved in very interesting circumstances as a private transmission scheme, even before formal guidelines on the tariff-based competitive mechanism were issued in 2006. Power Grid Corporation of India awarded the project to Reliance (ADA) Group after conducting an international competitive bidding process.

Overview: The Rs.1,500-crore project, currently in the final leg of commissioning, involves construction, operation and maintenance of around 3,285 ckm of nine major transmission lines in Maharashtra and Gujarat. The system aims at transferring around 4,000 mw of surplus power from the eastern region to consumption centres in the western regions. Out of the nine lines, six covering 2,137 km are in Maharashtra while the remaining three are in Gujarat. The project in

Maharashtra is being developed by a special purpose vehicle Reliance Power Transmission (Maharashtra) Ltd while the Gujarat counterpart will be handled by Reliance Power Transmission (Gujarat) Ltd.

History: WRSS-II, in its original plan, involved 17 lines of 400kV, three of 765kV, extension of 18 existing substations and construction of three new substations. Central transmission utility, Power

Grid Corporation of India, was supposed to develop this entire project, then estimated to cost Rs.5,200 crore, in joint venture with selected private sector partners.

In August 2004—even before PGCIL could begin seeking partners for the project—Reliance ADA Group, through Reliance Energy Ltd (now known as Reliance Infrastructure Ltd) made an application to Central Electricity Regulatory Commission (CERC) for grant of licence to develop some schemes under WRSS-II. Subsequently, Reliance ADA Group, sought to develop the entire scheme. Central Electricity Authority, during the CERC hearing of Reliance's case, suggested that WRSS-II be taken up in four separate sets—denoted from A to D. The rationale behind this was to encourage competitive bidding amongst bidders. In its order (No.85/2004) dated July 29, 2005, CERC turned down Reliance's application of developing WRSS-II all by itself. CERC ruled that two components of the scheme (A and D), involved advanced infrastructure like 765kV and 400kV quad lines. CERC maintained that these two components should be done by PGCIL—either solo or in joint venture with private players.

All the same, CERC, admitting that private sector participation was necessary in the power transmission space, directed PGCIL to select a private entity to develop components B and C. These were to be developed through 100 per cent private equity participation as an independent power transmission company. Accordingly, PGCIL invited bids for these two components and Reliance Power Transmission Ltd emerged winner in both of them.

Current Status: According to information available, seven out of the nine components of WRSS-II have been commissioned, and have started commercial operations. (See table). Commissioning of WRSS-II started with the 400kV 116-km Solapur-Karad line that was put into operations in January 2011. Amongst the recent components to turn operational was the 311-km Pune-Parli line that was put into commercial operations in November 2013. The two lines pending commissioning are the Pune-Aurangabad line in Maharashtra and the Raigarh-Karamsad line in Gujarat.

execution, PGCIL is also experiencing difficulties with one of its projects. In March 2012, PGCIL won the 765kV Vemagiri-Khammam-Hyderabad transmission project that was bid out by nodal agency REC with Vemagiri Transmission System Ltd being the special purpose vehicle. The transmission line, costing Rs.1,300 crore, seeks to evacuate power from existing and upcoming gas-based power plants in Andhra Pradesh. PGCIL clinched the project with a very aggressive bid of Rs.119.7 crore per annum; the next best bid (L₂), at Rs.155.7 crore, was as much as 30 per cent higher. PGCIL, it is reported, is dithering on implementing the project as it is seeking clarity on availability of gas in Andhra Pradesh, thereby establishing the viability of the very power generation plants from which electricity will be evacuated. PGCIL has even appealed to CERC seeking higher capital costs and transmission charges due to the delay in project implementation. Unconfirmed reports suggest PGCIL might be finding it difficult to honour the aggressive bid quoted in winning the project, and is hence deferring its implementation. CERC and CEA have reportedly ruled against PGCIL and have directed the transmission utility to implement the transmission line as soon as possible.

OVERALL PERFORMANCE

It has been over seven years since bidding for the first ultra mega power transmission project was conducted. Despite this fairly large passage of time, the overall success does not appear very convincing. Till mid-April 2014, a total of only 17 projects were awarded, an achievement that quite belies expectations. When the process was rolled out, the plan was to award 14 projects in a span of two years. Due to delays in awarding projects, some schemes, as discussed earlier, could not be pursued through the PPP model and devolved on the de facto agency PGCIL.

What is disconcerting is that physical construction on projects is taking much longer, ostensibly because pre-construction aspects like securing right-of-way, environmental

STATUS OF WRSS-II		
Component	km	Status
Maharashtra		
Solapur-Karad	116	Completed
LILO of Lonikand-Kalwa	NA	Completed
LILO of Parli-Solapur	150	Completed
Solapur-Kolhapur	220	Completed
Pune-Parli	311	Completed
Pune-Aurangabad	NA	Under Construction
Gujarat		
Limdi-Ranchodpura	130	Completed
Ranchodpura-Zerda (Kansari)	140	Completed
Raigarh-Karamsad	240	Under Construction

clearances, etc is taking unduly long. At least three interregional power transmission projects are contending with intense local opposition and their completion remains elusive.

Some developers agree that private participation in power transmission has not picked up as expected. Power transmission is a very land-centric activity. Land requirements are even greater when it comes to interregional lines. Some power transmission players are of the opinion that the government could do much better in terms of assisting private sector mainly in land acquisition and securing environmental clearance. Ramesh Chandak, MD & CEO, KEC International Ltd, observed, "Large part of project cash flows is linked to the project completion and hence a delay in the completion impacts the working capital cycle. It leads to cost overruns, which creates serious cash flow burden on the contractor. Hence there should be a mechanism whereby the environmental issues are sorted before the bidding process."

Lack of private sector participation is evident from the dwindling number of bidders. The first set of projects, way back in 2006, had attracted around 25 players—both domestic and international. However, the number of qualified bidders has dropped to 5-6 in recent cases. As mentioned elsewhere in this story, the response to a very recent project, which is the transmission scheme associated with Torrent Power's 1,200-mw DGEN power plant, has been very tepid.

The tariff-based competitive bidding mechanism is still relatively new and there have been some concerns about this novel mode. TBCB, it may be mentioned, has also been applied in the ultra mega power project series. Here there have been at least two cases where developers have found it difficult to honour the tariffs quoted during the time of bidding due to unexpected external factors. The same could also be true in power transmission. Cost escalation could always occur if there is any delay in project implementation and this could have an adverse bearing on tariffs. It can also so happen that developers put

Power transmission needs policy-related focus



Overall for the XII five-year plan, infrastructure sector in India, envisages private sector investment of about 48 per cent, up from 38 per cent during the XI Plan period. In India, the thrust on private participation in the power transmission space is gradually increasing. The tariff based competitive bidding route to bid for projects for private players has received acceptance from private players whereby their participation is increasing.

To further enhance and improve private participation it is important that private players be given a level playing field vis-à-vis public players. Also the bidding for transmission projects is a lengthy and time consuming process which needs to be cut short.

As transmission lines traverse across regions in India, the company executing the transmission line projects is often faced with land acquisition and environment-related challenges. The issues on account of land acquisition and RoW (Right of way) impact the completion time line of the project. Large part of project cash flows is linked to the project completion and hence a delay in the completion impacts the working capital cycle. It leads to cost over runs, which creates serious cash flow burden on the contractor. Hence there should be a mechanism whereby the environmental issues are sorted before bidding process.

Although the Indian government is active in devising plans and policies conducive for the development of this sector, this sector needs more policy-related focus to expedite and remove the execution and procedural bottlenecks which will lead to more private players foraying into this space.

— Ramesh Chandak, MD & CEO, KEC International Ltd



Schemes coming up for award

There are currently four interregional transmission schemes that are likely to be awarded in the coming weeks. While Power Finance Corporation Ltd is the bidding process coordinator (BPC) for one, the remaining three are being handled by Rural Electrification Corporation.

PFC's project is the transmission scheme associated with the upcoming 1,200-mw gas-based DGEN thermal power station of Torrent Power Ltd in Gujarat. Highly placed sources indicate that the response to this project has been tepid with only a handful of players reaching the request for proposal (RfP) stage. Incidentally, this transmission scheme, according to initial plans, also envisaged an interconnection between Srinagar and Tehri (both in Uttarakhand). The interconnection was subsequently omitted.

Rural Electrification Corporation is going to award three schemes very soon with bidders reaching the final qualification stage. The projects in questions are the north region system strengthening scheme (known as NRSS XXIX); the Baira-Siul-Sarna transmission scheme; and the evacuation scheme associated with the 1,320-mw coal-fired power plant of NCC Power Projects Ltd (Nagarjuna Group). For NRSS XXIX, six bidders have qualified while seven are in the fray for the Baira-Siul scheme. The NCC power project transmission scheme (known as the Nellore project) has six aspirants in the race.

Central transmission utility Power Grid Corporation of India and private player Sterlite Grid (Vedanta Group) have qualified for each of the three projects being handled by REC. The three projects have together attracted international names like Isolux-Corsan (Spain) and new domestic entrants like Jyoti Energy, Ashoka Buildcon and GKC Projects.



in very aggressive — and sometimes unrealistic — bids to clinch a project. Once such projects encounter delays, their implementation gets stuck as the developer would find it very difficult to honour the tariffs promised. Stranded projects then could get into legal disputes and get delayed indefinitely. Interregional power transmission lines are usually part of the national grid and therefore have forward and backward dependencies. When any one transmission line is delayed, it has adverse implications on adjacent links.

In any sector, the involvement of private sector always brings in techno-commercial efficiency. This is in fact the basis for seeking private enterprise in the first place. In developed countries, huge benefits have accrued after the induction of private entrepreneurship. Better technical and commercial management have also resulted in an appreciable fall in power tariffs. Thus, private sector involvement has thus directly benefited the end consumer. All the same, India has yet to see the benefits accruing from wider private sector participation. Sharing his views on the phenomenon, Rishabh Sethi, Chief Operating Officer, SPML Infra, said,

“In India, the experiment with PPP in the interregional power projects has not been very successful due to lack of investors’ confidence. Private participation has been gloomy despite the initial good start.”

EPILOGUE

Encouraging private participation in ultra mega power transmission lines is a philosophy that needs to be pursued relentlessly. Without the involvement of the private sector, the power transmission sector will always be found lacking in technical and commercial efficiency. Unfortunately, private sector involvement in interregional lines seems to have slowed down over the past few years. This is certainly not a positive augury. While the private sector has proved its competence as a construction contractor of power transmission lines, inadequacies are presenting themselves when it comes to “development”. As a transmission service provider, a private sector enterprise has to contend with several pre-construction issues that never came under its ambit as a contractor. Securing right of way, obtaining the



Experts Speak



“The private sector has been actively participating in power transmission and distribution for over 20 years now in the developed countries due to large scale liberalization in electricity sector. The liberalization has separated generation and T&D in a big way and apart from reduction in AT&C losses, it has bring in lower tariffs for consumers. But in India, the experiment with PPP in the interregional power projects has not been very successful due to lack of investors’ confidence and private participation has been gloomy despite initial good start. Even the Electricity Act, 2003 opened new avenues for private sector participation, the private investment in power sector in general and transmission in particular has been far from expectations.”

—Rishabh Sethi, COO, SPML Infra Ltd

“Though the tariff-based competitive bidding (TBCB) model in transmission sector has been in place since 2006, not many projects have seen the light of day. The success rate is low for a variety of reasons which include lack of awareness of this business model and generic Qualifying Requirements (QR) lead to participation from non-serious players; bidders quoting undeliverable bid numbers; unhealthy competition; lack of expertise in design and engineering practices; obsolete techniques used in transmission lines construction.” (Full interview with S.N. Sunkari presented elsewhere in this edition.)

—S. N. Sunkari, Joint General Manager -- Business Development (Power Transmission), L&T Infrastructure Development Projects Ltd



often elusive environment clearances, contending with social antagonism are just some of the problems that private developers need to grapple with. The government must ensure that all pre-project formalities are completed even before bidding begins. It is rather unfair of the government to leave private sector enterprises fending for themselves on matters that come under the government’s ambit of responsibility. The area of opportunity for private enterprise in an area like power transmission is inestimably vast. The government must do full justice to its role as a facilitator—the positive change thereon is assured.

Important Note: This special story discusses the performance of just one aspect of private sector power transmission, which is interregional lines being awarded under tariff-based competitive bidding by nodal agencies Rural Electrification Corporation Ltd and Power Finance Corporation Ltd—a

process that was initiated in 2006.

Private power transmission has seen many more facets, which Electrical Monitor has been actively covering in its analyses. Some other modes of private participation in power transmission include the six joint ventures that Power Grid Corporation of India Ltd has formed with independent power producers for setting up evacuation systems associated with their respective power generation plants. In each of these JVs, PGCIL has been a minority partner PGCIL has also formed a JV with Tata Power for setting up a transnational line between India and Bhutan.

Private participation has also percolated to intra-state lines with states like Maharashtra, Haryana, Rajasthan and Uttar Pradesh realizing at least one project on PPP mode. States have adopted different modalities like joint venture route in which the state transmission utility has been the minority partner, and fully privately-owned power transmission lines. 