

# Industry Speak

As results of the second batch of JNNSM bidding have been announced and the mission plan approaches the closing of its Phase I, *PWI* spoke to a cross-section of industry experts from consultants, business providers, to vendor organizations on their assessment of India's most ambitious solar programme and what have been the lessons learnt...

## What is your assessment of the progress of JNNSM?

### C&S Electric

Prior to the launch of JNNSM there was hardly 10 MW of grid tied solar PV installations in the entire country, which has increased to 143 MW commissioned till Nov 2011 under the JNNSM and about 95 MW in Gujrat. No doubt, JNNSM has progressed well and made utility scale solar PV power plants a reality.

### RESolve Energy Consultants

Despite teething troubles, I feel the JNNSM is progressing well. The MNRE did a good job in completing the bidding process of both the batches of the Phase 1 within the planned time schedule. The bidding can be viewed as fairly transparent, if the allegations against Lanco are unfounded.

28 out of the 30 projects from the first batch allocation had signed PPAs and half of them had commissioned their projects before the deadline. Some of the projects, even though completed, could not start power generation due to lack of adequate evacuation infrastructure. 14 projects missed the commissioning deadline and were promptly penalised by the NRVN by encashing their bank guarantees. MNRE deserves credit for not extending the commissioning deadline and also for letting the NRVN penalise the projects that missed the deadline.

### Mercados

There is no comprehensive status of projects that were bid out in the first round of the JNNSM bidding.

However from information available in the industry, most projects are on track. Projects of companies like GreenInfra, Azure Power, Welspun, Ashtonfield have been commissioned. There are some projects that are finding it difficult to meet the timelines, but these will form at most 25-30% of the total capacity that has been bid out.

### Tata BP Solar

JNNSM has been phenomenally successful in spreading awareness about the importance of solar power. In the first phase of bidding for grid-based solar power, in two batches, several bids have been received and these have seen a drop in prices of solar power. Because of JNNSM and MNRE, India is on its way towards achieving grid parity between conventional and renewable energy.

### TERI

Without any doubt one can say that JNNSM has given a big boost to solar energy, particularly solar power, like never before. But JNNSM is not only about grid power; it has other important components pertaining to off-grid electricity and other decentralized applications in different sectors. And all of these need to be kept in mind if JNNSM is to be evaluated in its totality. And from that point of view, the progress could be a mixed bag.

**Pre-JNNSM, the major barrier in solar power was its high cost. Within the two years of its launch, the cost of solar has come down drastically from 17-18 per unit to 7.50 per unit, as suggested by the bids of**



"It is true that the tariff has drastically reduced under the reverse bidding process putting a question mark on the viability/sustainability of such projects. These low tariffs are challenging since PV technology is disruptive in nature and evolving constantly."

Rohit Dhar, Sr. Vice President & Business Head, Solar PV Power, C&S Electric

**second batch bidding. According to you, what has led this drop? Many sector players in the field think such bidding is unsustainable. What's your opinion?**

#### **C&S Electric**

It is indeed true that the tariff has drastically reduced under the reverse bidding process putting a questionmark on the viability /sustainability of such projects. However, some of these developers who have bid with low tariff are experienced developers who have a track record in Solar PV and have access to overseas funding. Here, technology is an issue as assumptions about higher yields have to hold and get validated over a period of several years. Undoubtedly, the low tariffs are challenging since the PV technology is disruptive in nature and evolving constantly.

#### **RESolve Energy Consultants**

There are various factors that have led to the drop. First is the falling cost of PV module prices that bidders may have factored in into their calculations. Second is strategic bidding. Many of the bidders, in their attempt to gain a first mover advantage in the sector, willingly lower down their threshold IRRs for strategic reasons. Lastly is financing. Some of the large developers opted for imported less expensive thin film modules that came with low cost financing support. This enabled these developers to reduce their capital cost.

While there are genuine concerns about the viability of these projects, in my opinion, the low prices of solar are here to stay and developers will find ways to make the projects viable.

#### **Mercados**

The recently concluded second batch of bidding has taken everybody in the sector by surprise. However, this is not necessarily an outcome of desparate measure.

The French company Solaire Direct (with a quoted price of Rs7.49/kWh) is the second largest solar power company in France. The company has quoted this price as a part of their market entry strategy as they have big plans of entering and growing in the Indian market. The French company has a pressing need to expand their market presence and India being one of the most promising market, the company had shown serious interest in the country with an anticipated target of

25 MW in the year 2011-2012. The company's market entry strategy is suitably backed by Rs 300 crore finance raised by the company. The company is already in talks with various banks in France such as Rabobank apart from a few private equity players to participate in the fund raising activity.

Welspun Solar, with three different bid prices is another low price bidder - three different price levels and a 50MW win. For Welspun, solar is once again of strategic importance. Project allotments in the first round of JNNSM phase I and projects from Gujarat state policy would have given them very good learning's and confidence to go all out to secure 50MW. With past experience, the company definitely would have working relationships with EPC companies, module makers, inverter and other BoP manufacturers, lenders etc. The company could very well leverage their strengths to have projects commissioned to with LCoE's low enough to make business viable at all the three high discount FIT's offered by them. The past experiences and associations comes in handy not only for Welspun, but a similar situation exist for a few other renowned solar PV developers like Azure Power, Mahindra Solar, Kiran Energy, Sai Sudhir Energy, Sun Edison India, Green Infra and Sun Borne Energy. All these companies have made the early mover advantage to their fullest benefit and managed to get projects allotted by quoting competitive yet viable prices.

#### **Tata BP Solar**

The companies that have bid must have done their own cost calculations and it would be unfair for anyone to comment on specific companies. In general, costs of finance are globally lower and excess capacity in some countries has led to a decline in prices in emerging markets like India. Many of the recent bidders have joint ventures with global companies. The drop in prices is desirable. However, there is always a trade-off between short-term costs and medium-term efficiency goals.

#### **TERI**

Yes, through the reverse bidding process, solar tariffs have been brought down substantially. Essentially, rather than being complacent on account of this price reduction, it is important to renew focus on other

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**Madhavan Nampoothiri, Director, RESolve Energy Consultants**



enabling factors such as R&D and enhanced indigenous manufacturing base.

**It is ironical to see that majority of the projects under the JNNSM scheme are being bagged by new and small players, quoting a low tariff rate. Are we on the right track with the JNNSM? Will these projects be able to meet the timelines and commitments?**

### **C&S Electric**

Once it has been decided to rely on the market mechanism of reverse bidding to uncover the tariff, it is inevitable that some new developers will come in who might not be experienced enough. But then what is the alternative? Probably there should have been a “qualifying criterion” for initial selection of the developers and then this should have been followed by reverse bidding of the qualified developers. The qualifying criterion could have comprised of financials and power industry background. This way the process would have worked much better.

### **RESolve Energy Consultants**

While some new companies did win in the first batch of Phase 1, most of the companies that won in the second batch are well established companies like Azure, Mahindra Solar, Welspun, Green Infra and Solairedirect, among others. By changing the selection criteria for the bidding of the second batch, the MNRE was able to ensure that serious players were awarded the projects.

While it is too early to comment if the projects will meet deadlines, in my opinion, a majority of the projects (in the second batch) will be completed on time and will meet their commitments.

### **Mercados**

This may be true for the first round of bidding of the JNNSM scheme, but not entirely true for the second round of bidding. There are fairly large and established players that have participated in the second round, having a clear strategy of quoting those prices.

It will be important to understand if these projects can achieve financial closure. At this stage, it is difficult to answer this in a straightforward manner. Most developers would go with a 100% equity since most of the winners are deep pocket developers. There are

some developers like Azure Power who have shown strong associations with Exim Bank in their previous projects where they used First Solar module. Exim bank has already expressed their willingness to back all the projects who use American modules.

Deadline for achieving financial closure in the second round of JNNSM phase I has been raised to 210 days (7 months) from the earlier 180 days (6 months). The timeline for the commissioning of the project is also extended by a month – to 13 months from the date of signing PPA from 12 months earlier in batch I. With one more month of additional time, one can only wait and watch to see what happens in the coming months.

### **Tata BP Solar**

Some of these aggressive bidders have quoted prices even lower than factory gate prices. If country's power infrastructure is to be built on such basis, it is a matter of sure concern. However, the country's interests and long term energy security lie in developing domestic manufacturing and R&D and pushing the performance closer to the global benchmark under similar playing conditions. In any process of bidding, there is a trade-off. The short-term goals may be of revenue maximization or cost-minimization. But that need not be the medium-term efficiency goal. That's the reason, in many natural resource segments, we have now had arguments against pure auctions. In any process of auctions or bids, criteria are used to ensure players are there for the medium and long-term and have the financial capability to sustain themselves and the industry. We are optimistic that MNRE will see justification and the compelling need to take care of such safeguards when setting minimum criteria for eligibility.

### **TERI**

Per se there is no harm there in having small players in the field, provided that (a) they have the required technological and financial wherewithal to fulfill their commitments in a timely fashion and (b) they have entered in this field with some long term perspective. Towards this, it may be worthwhile to get an independent evaluation of Phase I projects and take corrective measures, if any, at early stages to avoid any negative impact on Phase II. However, in case of solar thermal power (CSP) projects, given the



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Namrata Mukherjee, Manager, AF Mercados EMI (Asia)

size and complexities of the plants, the involvement of established players with right sort of technology partners would be reassuring, especially to the financing community. We need to understand that solar energy is poised for a quantum transformation in the country and therefore, a little more due diligence would help avoiding potential severe setbacks at a later stage.

**What's your opinion about mandating domestic content requirement under JNNSM? Is it helping the domestic industry or is it proving to be counterproductive?**

**C&S Electric**

Mandating domestic content up to a point is understandable. For example one could specify Indian PV Modules for crystalline technology but specifying Indian made cells is incorrect. This is what has been done in NVVN -Batch -II and it mitigates against the objective of having high energy efficiency. PV Cells technology is evolving constantly and good Indian module manufacturers should have the freedom to use the best value for money cells from anywhere in the world. The result of specifying Indian made cells for crystalline PV Modules is that module prices with Indian made cells are higher than the international prices. This is not desirable. Moreover, the track record for Modules with Indian cells for Utility Scale PV power plant does not exist on ground.

This too is a factor for pushing the developers towards thin film where import from any part of the world is permitted. Crystalline PV which is the proven technology has lost out on account of this restriction.

The correct way to encourage domestic cell manufacturers is to provide them fiscal incentives - it certainly is not correct to restrict the use of imported cells. Why would not one buy an Indian cell if its reliability is assured and price point is competitive? How does restriction help in this?

**RESolve Energy Consultants**

Data suggests that this well intentioned policy has not had the desired impact in terms of helping the domestic PV manufacturing industry. The reason for this is that the domestic content requirement is mandated only for crystalline silicon technology whereas it is not

applicable for thin film technology. Currently, imported thin film modules account for about 60-70% of all PV installations in the country (including projects under the Gujarat State Policy).

Thin film modules are cheaper than crystalline Silicon and their theoretical output in the high temperature climate of India made it an attractive option for project developers to opt for it. It is to be noted that there is no long term performance data to validate the theoretical higher yield of thin film technology. Even though the price difference between crystalline Silicon and Thin films have considerably narrowed, less expensive financing options available for imported thin films makes them quite attractive.

The bottom line is that the domestic content requirement needs to be either backed by strong financing support from Indian lending institutions or government incentives for the products of domestic PV manufacturers to make the mandate effective.

**Mercados**

India is definitely trying to build an indigenized industrial base for solar technologies. This was one of the main reasons for introducing a separate clause on the level of indigenization that was desired for both solar PV and solar thermal in the initial draft of the JNNSM. However, the Mission now requires only 100% indigenization for crystalline silicon (cell and module). There is currently no indigenization mandate on thin-film PV modules and on solar thermal. This is one of the reasons which have contributed to most of the solar PV plants that have come up under the JNNSM to be based on thin-film technology.

Although there is a need for some level of indigenization in solar manufacturing to bring down costs in the future, this needs to be introduced only gradually. Solar PV technology is predominantly driven by international markets. Even though India is witnessing economies of scale beginning to slowly kick-in the grid connected solar power segment in comparison to the past decade, it will take sometime for this technology to be indigenized completely.

**Tata BP Solar**

At the moment, domestic content mandate only applies to crystalline silicon cells and modules. It does

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**K Subramanya, CEO, Tata BP Solar**



not cover technologies like thin film. Most developers have now moved into thin film technology primarily because of low cost and import benefits favouring overseas manufacturers as against domestic. One can say in a way domestic content requirement became counterproductive. Therefore, the domestic content requirement needs to be tweaked and its coverage made more general. Domestic content requirements are generally subject to WTO disciplines. However, there are exceptions under which, domestic content requirements are permitted, for developmental reasons. So far as the WTO is concerned, such clauses can only be tested when there is an actual dispute. Other countries also have domestic content requirements, to help further the cause of domestic industry. But there are many constraints that impede the development of solar power in India. It is important to remove all these constraints. As long as these constraints exist, domestic content requirements per se, are only a small instrument, though they help, however for the country's interests and long term energy security, developing domestic manufacturing and R&D and pushing the performance closer to the global benchmark under similar playing conditions are more desirable.

### **TERI**

The ambitious goals of the JNNSM cannot be achieved through imports only. As I take it, JNNSM is not only about creating a sizable solar energy capacity but more importantly, about strengthening India's manufacturing and R&D base as well. And much of this could be done in collaborative fashion. Ultimately these fundamental strengths will help us achieving JNNSM targets and beyond.

### **According to you, what are the problems being faced with the implementation of the Mission?**

#### **C&S Electric**

There is a whole aspect about grid - connectivity and grid outages which pose a formidable challenge to the developers and operators. Domestic funding for solar PV Power Plants at interest rates comparable to overseas funding needs to be facilitated. Both these would be great enablers for Solar PV Power projects.

#### **RESolve Energy Consultants**

The foremost challenge is to secure funding for solar projects. The low bid prices have lowered the returns from PV projects and have reduced the appetite for lending from financial institutions. Then, there are project delays due to land acquisition issues, Lack of adequate trained manpower and land clearances, besides power evacuation infrastructure hurdles that need to be looked into.

#### **Mercados**

The important point that needs to be addressed is that project developers and technology providers will be looking for sustained long-term market prospects, assured policy continuity commitments from the Government beyond the first phase and availability of financial resources for subsequent phases. The planning for the second phase, therefore, becomes crucial and should be based on a sound analyses of lessons learnt from Phase-1 to provide the required contribution to the adequate policy design and support.

#### **Tata BP Solar**

JNNSM is a Central mission. But delivery is not just a Union government subject. It is subject to implementation at the level of the States, and also requires decentralization of planning at the district level, without various organs of the government working in silos. This is not specific to JNNSM alone. The problem extends to all Central missions, schemes and programmes. Therefore, there are indeed problems of implementation and I am sure both MNRE and JNNSM recognize them and will rectify them.

#### **TERI**

One of the major problems pertains to the financing of solar power projects. In India, capital cost and financing constitute 85 to 90% of the total cost of solar power as compared to only 30 to 35% for coal-fired power. However, the perceived risk of solar power technologies is very high for the financial institutions and banks, resulting in access to finance and its high cost.

Another problem, albeit less discussed, relates to the availability of trained human resource. Our current institutional set up is simply not geared up to meet this spurt in demand.



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**Amit Kumar, Director, Energy Environment Technology, TERI**