

## **SOLAR POWER**

### **Innovations in 648MW Solar Project**

Energetica India

*Sgurr Energy India was selected to deliver engineering services for Adani Power's 648MW solar project. The project was not only completed within the stipulated time but also had quite a few innovative ideas that helped in successful implementation. Energetica India finds out more through their interaction with Sgurr Energy India*

SgurrEnergy India Pvt.Ltd was selected by Adani Power to provide solar engineering services to the world's largest solar project, the 648MW (AC) solar project located at Kamuthi village in the Ramanthapuram district of TamilNadu, India. This is the world's largest solar power project at a single location.

The project, which had a one year concept-to-commissioning timeframe, required engineering services within three months. SgurrEnergy delivered all services on time and on budget, including the project concept, technology evaluation, energy yield estimation, quality assurance plan, detailed engineering, and other associated design services, to support the 648MW solar project.

SgurrEnergy assembled its diverse, integrated team of experts to ensure on time and on budget delivery, including solar advisors, electrical, civil, structural, and infrastructure engineers, plus project managers with a history of designing projects that maximize the value of the solar asset.

The 648MW solar project was pre-conceptualized with effective cost-to-benefit analyses for all the commercially proven technologies even before it was awarded to SgurrEnergy India. Multiple technologies and vendors were deployed to supply modules, inverters, and mounting structures to meet the large project's strict timeline. Design innovation was implemented throughout the project, including a modular design to reduce execution time, and an eight row module table was utilized for the first time in India, reducing the project costs and construction timeline. Because land for the project was not all available at the onset, SgurrEnergy was very flexible in its design process in order to minimize land requirements.

**Energetica India speaks to Mr. Arif Aga, founder and Managing Director, SgurrEnergy India to get more details on the innovations used on this project**

**Energetica India: What kind of design innovation was used in Adani Power's 648MW solar project?**

**Mr. Arif Aga:**

Given the low latitude location, the project was designed for a tilt of 8° and taking into consideration the land constraints, an eight-row landscaped polycrystalline module table was employed for the project for effective land area optimization and to reduce execution time. This is the first time in India that such a design was used.

Although this project is implemented predominantly with polycrystalline solar PV technology, a 72MW section of the plant comprises of all the commercially available PV technologies and mounting systems. This includes monocrystalline, CdTe, CIGS, and bifacial modules. In addition there are seven different brands and designs of single axis trackers used within this section of the project.

Adani Power, being one of the large business houses in India and having big solar plans, was quite passionate about exploring various technologies and mounting systems. We thus evaluated and designed the project utilizing these various technologies to achieve our client's goal of getting firsthand experience on the available technologies and mounting systems.

**Energetica India: Till what extent were the costs saved with the innovation?**

**Mr. Arif Aga:** SgurrEnergy India usually provides services on technical aspects of the solar project, but yes keeping the budgets in mind. We can only give you a few examples of our designs that were not only cost effective but were faster to implement. Most of these designs have since become industry trends that are being widely followed today.

- Considering the project size and concept, the module mounting structure was designed with 32 tons of steel for a MWp installed. The minimum structural section employed was not less than 2mm thick.
- This was the first time in India that a 5MVA was deployed. Five winding transformers were employed for the project, which enabled the lowest possible costs for electrical balance of plant systems.
- Inverter rooms were designed with no plinths; the prefabricated structure was just placed on the pre-casted columns. All the interconnecting cables were then routed on pre-fabricated cable trays. Cabling, being in the open air was optimized and sized for minimum deration.

- SCADA was completely integrated for maximum required information; we believe this was the first time zone monitoring system that has been used in India for a project of this scale. SCADA was also comprised of active power curtailment, which was never spoken about nor implemented in the Indian solar industry prior.

**Energetica India: Having great insights into the sector, what is your opinion on how low can the solar tariffs in India reach?**

**Mr. Arif Aga:** Globally solar tariffs have been falling consistently and India is not an exception. However, preference of price over project implementation quality is a key concern for projects to achieve a 25 year lifespan.

PV module prices have been consistently falling for the last seven to eight quarters, which may be due to various technical advancements and other non-technical related reasons. However, we have not seen a similar fall in plant BOS costs. The proportion between module and BOS costs is still 50:50 or 40:60. Yes, there are technology enhancements in BOS but not at the rate of falling module prices. There are project configurations based BOS optimizations, like multiple winding transformers, and new structural materials that help reduce BOS costs.

Going forward with limited scope in further BOS optimization, I think only the module price is expected to govern project tariffs. Land and infrastructure-ready solar parks will generally influence lower tariff rates - the REWA solar park is the best example of this.

**Energetica India: What kind of parameters do you recommend solar developers and EPC players to focus on to complete projects within time and stipulated budget?**

**Mr. Arif Aga:** We always recommend parameters that would affect the project quality and sustainability for a project life of 25 years, such as, utilizing certified products, in-process inspection of modules to ensure the quality of modules, manufacturing quality audits of BOS component suppliers, and rigorous quality checks during the construction.

Developers should safeguard their interests by keeping back-to-back guarantees with the EPC contractors in the form of liquidated damages (LDs) in order to guarantee performance and as a precaution against delays.

With the current price trend, solar projects are operating with very thin margins. As a result, projects cannot afford longer downtime. In order to avoid such downtime, stringent back-to-back warranties with the component manufacturers for achieving maximum availability should be negotiated.

