

A Private Open access Solar farm at Sedam, dedicated for corporates to achieve their RE100 target through flexible ownership



Quick Facts

- ▶ Location – Sedam Village, Gurbarga District, Karnataka
- ▶ Capacity – 145 MWp
- ▶ Type of System – Open access, Grid-connected Solar Farm
- ▶ Annual reduction in energy bills – INR 310 million or USD 4.5 million
- ▶ Carbon Dioxide abated – 208,800 tons per annum
- ▶ Date of Commissioning – 30th March 2018

Overview

Located in the semi-arid regions of North Karnataka, CleanMax's 145-MegaWatt solar farm in Sedam village (Gulbarga district, Karnataka) is enabling corporates across the state of Karnataka to switch over to green solar power in a low-risk and zero-capex manner. The project was commissioned and became operational on 30th March 2018, within four months of commencement of installation work.

One of the most technologically advanced solar farms projects in India, with 1500 VDC technology, the Sedam plant operates at a 1.45:1 DC/AC ratio, which is the highest overloading achieved by any project in the country, providing for a highly efficient use of equipment and infrastructure. The 135-ton transformer was custom-designed with several additional safety features as mandated by our EHS and engineering design team. It is designed to take 120% continuous power loading for two hours, without any capital addition, and hence, the upfront and lifetime operating costs are reduced substantially.

Through innovative legal and technical structuring, multiple end-users with diverse legal and technical requirements can consume power from the same project through the project's common infrastructure. The project houses a mix of a) capacity supplying power to corporate clients through zero-capex (third party sale) and b) captive ownership by the end user, in which CleanMax has developed the plant and now provides O&M services to the users. Moreover, as an efficient and low-cost generator of solar power, the project accrues an annual cumulative savings of approximately INR 310 million per annum (approx. USD 4.5 million) across all its clients.

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Examples of Clientele

Bangalore International Airport Authority Pvt Ltd (13 MW) meets 28 % of its annual electricity requirement from the Sedam plant; Adobe India's Bangalore facility (2.5 MW) is 100% solar powered by the Sedam plant; Volvo Group India's truck facility in Bangalore sources 2.75 MW solar power from the Sedam project.

Challenges

- Land acquisition for solar projects is challenging due to the need for contiguous land parcels to set up the project.
- The project was designed to meet the large power requirements of corporates through innovative and customizable legal and financial structures such as third-party sale, captive power consumption, from the same solar farm with common infrastructure.
- Due to rocky terrain, drilling activity for installation of mounting structures and running cables across 450 acres was laborious and challenging
- Given the tight scheduling of the project, which had to be completed within four months, mobilizing construction vendors and housing manpower had to be promptly and efficiently managed.
- The remoteness of the location, in addition to the tight schedule, meant the delivery of raw materials, large machineries, high-end equipment and logistical management during the installation work had to be smooth and properly coordinated.
- Above all, given the scale of the project and the labour force, safety and synchronisation across teams becomes extremely important, both during and post installation of the project, to ensure a safe, timely and efficient process.

Solution

- Selection of land for the private solar farm was done in a socially and ecologically conscious manner. Sedam is a drought-prone, semi-arid area which is unsuitable for agriculture. Hence the land could be diverted for solar power generation activities without disrupting agricultural production and livelihoods. Also, it receives extremely high-intensity solar radiation of 5.4 to 6.2 kWh/m²/day, and experiences 240 to 300 sunny days in a year, making it an ideal location for solar power generation.
- To accommodate the diverse legal and technical requirements of more than fifty large scale

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commercial and industrial power consumers, and to supply solar power from the same farm through common infrastructure, CleanMax implemented innovative legal and technical models to suit this purpose, with a combination of self-investment (captive) and zero capital expenditure (third-party) models to meet the requirements of both segments. However, across all these models, CleanMax is responsible for operating and maintaining the entire project of 145 MWp, both for sale to its open access clients (70%) as well as for the captive consumers (30%).

- Due to the presence of hard rock strata within 300mm of the surface, UV-protected DC cables are laid above ground, thereby maintaining a lower temperature in the cables trays compared to buried cables in standard sub-soil conduction.
- Given the large labour force present at the site during the construction phase, adequate accommodation and amenities were provided. A labour colony that can accommodate more than 500 people with necessary and safe facilities including food, sanitation, drinking water, medical assistance through a partnership with the local hospital and a 24/7 onsite ambulance were installed.
- For efficient management of logistics and the labour force, the entire project site was divided into four zones, with the labour colony and store house installed in the center of the site, making it equidistant from all four zones. However, the bay area (i.e. the logistics area), and the storage facility, which encompassed eight acres, were built close to the highway, so that the movement of heavy vehicles does not disrupt the local traffic and village life.
- At the peak of its construction activity, there were almost 800 employees and contractors working at the site. All were trained in safety and safe environmental practices. A site-specific, comprehensive Environment Health & Safety (EHS) policy was drafted and all the employees working at the site, both during and after installation, had to undergo an orientation and mandatorily participate in the daily safety demonstration sessions as per the policy guidelines.

Highlights

- The project reduces the emission of 208,800 tons of CO₂ annually and brings in cumulative savings of approximately INR 310 million per annum (approx. USD 4.5 million) for its clients.
- It enables numerous corporates to procure green power as per their consumption requirements and legal/financial preferences, i.e., either through zero capital expenditure or complete capital investment.
- At the time of its commissioning, the Sedam farm was India's first solar power project built with a 1500 VDC system and a DC to AC ratio of 1.45:1, which was also the highest overloading achieved by any project in India.
- The project generated direct employment for approximately 800 people, including 200 semi-skilled and unskilled workers from the local village, who were also given vocational training during the installation phase. Moreover, approximately 100 workers will be employed at the site throughout the life of the project, in operation, maintenance, and security functions.

About CleanMax



CleanMax is the sustainability partner for India's leading corporates. Headquartered in Mumbai, we are the largest provider of solar power to commercial and industrial customers.

The company develops projects on turnkey basis, providing cheaper-than-grid solar power without any upfront investment from its customers. With a highly skilled in-house team, CleanMax operates across India, Middle East and South East Asia.

Our track record with India's top companies has made CleanMax a preferred partner across sectors such as Automotive, Pharmaceuticals, Food & Beverages, Information Technology, Education and many other industries. We also partner with some of India's leading government institutions and top universities.

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