



India's First 24x7 BESS based Solar Powered Village: Modhera - 'Suryagram'

A Pioneering Initiative in Harnessing Solar Energy



(BESS: Battery Energy Storage System)

Deriving Inspiration for Progress from the Sun

The magnificent Sun Temple in Modhera. Dedicated to the Sun God, the temple at Modhera occupies a pride of place among Gujarat's religious destinations.

In Indian culture, the sun is worshipped since it sustains us, provides warmth and gives energy to all life on earth. The ancient practice of venerating natural elements and its association with humans was considered the prime force and energy of the life cycle.

India is never short of sunshine and the innumerable benefits that it bestows. In the course of our efforts to reduce the nation's dependence on conventional sources of power, many of which are polluting and costly, we were faced with a possibility: Can the iconic Modhera Sun Temple be lit by Solar Power?

It was then felt there can be no better way to show our devotion than by illuminating the beautiful precincts of the Sun Temple & villages through solar power.





Blessed by clean energy, through smart technology

There is perhaps no cleaner and unlimited energy than solar power to which we can connect India's vast power requirements to, and safeguard ourselves and the environment.

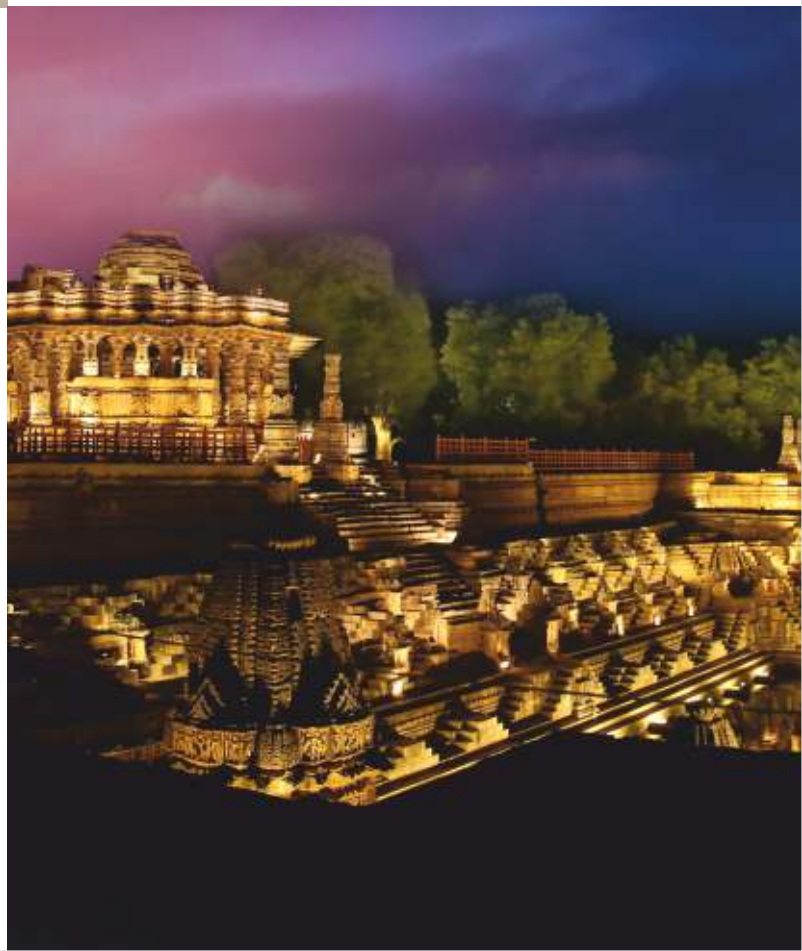
India's 1st integrated state of the art solar project, was conceptualised by the Government of India, along with the Government of Gujarat and implemented through Gujarat Power Corporation Limited. It solarised the town of Modhera, in Mehsana, Gujarat. Since its completion, it is fulfilling the domestic, agricultural and commercial electricity needs of Modhera through solar energy.

The Solarisation of the town was a key part of the discovery of new frontiers for application of renewable energy. It enabled the country move an important step forward towards realising our goal of becoming a Green Energy nation.

Modhera Temple Dedicated to the Sun Lit by the Sun

Solar power plant along with BESS is providing round-the-clock illumination to the Modhera Temple. It puts the spotlight on conversion of solar energy into power to light the temple.

As the sun brightens the day, so too does solar power shed light on the modhera village and sun temple.



The Modhera Solar Project: Ushering in a bright future

India's 1st integrated state of the art solar project is a marvel of technology. In solar power projects, the electricity generated is usually passed on to the grid without storing it anywhere. Keeping in view the limitations of solar power generation till day time only, the implementation of BESS proves much helpful to overcome the gap of 24x7 electricity supply

A 6 MW (PV) ground-mounted solar power plant with 15MWh Battery Energy storage System (BESS) has been set up near Modhera village. The Battery Energy Storage System feeds solar power 24X7 to the village. 1383 grid-connected Solar Rooftop Systems (1 kW each) (*Modhera-1177, Samlanapura- 105, Sujjanpura- 101*) have been installed, helping the village to unburden itself from the consumption of conventional energy.

Gujarat Power Corporation Limited has also set up Smart Energy Components such as smart energy meters for individual households and 11 kV feeders, solar EV charging stations, smart streetlights and interpretation centre cum museum near the Sun Temple.

Power generation, fueled by Solar Energy

▶ 6 MW

Grid Connected Ground Mounted Solar PV Power Plant at Sujjanpura village

▶ 15 MWh, Battery Energy Storage System (BESS)

at Sujjanpura

▶ 1383 Numbers of 1 kW Solar Rooftop Systems on Residential buildings

▶ 1700+ Smart Energy Meters

installed at electric consumer level of Modhera

▶ Residential Rooftop Solar Systems At Modhera, Samlanapura & Sujjanpura

1177 in Modhera (37+271+869)
105 in Samlanapura
101 in Sujjanpura

▶ 50 KW Solar Parking Infrastructure

with 150 kWh Battery Storage, with Electric Charging Stations installed near Modhera Sun Temple

▶ Sensor-based Smart Streetlights

installed near Modhera Sun Temple

▶ 316 KW Rooftop Solar PV Systems on Govt. Buildings at Modhera

100 kW in Phase I
216 kW in Phase II

▶ SCADA based Smart Energy Centre

(Interpretation centre cum Museum) built near Modhera Sun Temple.



A new dawn over Modhera

Modhera was the first-of-its-kind project that saw the exclusive supplying of the renewable power (solar energy) round the clock.

A 6 MW (PV) ground-mounted solar power plant with 15MWh Battery Energy Storage System (BESS) has been set up at Modhera which provides round the clock solar power to the entire village. 100% Smart meter connection in a rural area and its Smart Energy Center ensures management of energy at a micro level.

Modhera village's dependency on conventional sources of electricity generation has been completely eradicated after the implementation of Solar BESS project in their village.

The solar project has also helped the villagers to waive off their electricity bills by 60-100%



Replacement of conventional meters by **smart meters** for close to 1700 residential and commercial connections



State of the Art real time Smart Energy Center **remote monitoring** the demand –supply situation of the village



1383 Numbers of 1 kW Solar Rooftop Systems is given in Modhera, Samlanapura & Sujjanpura



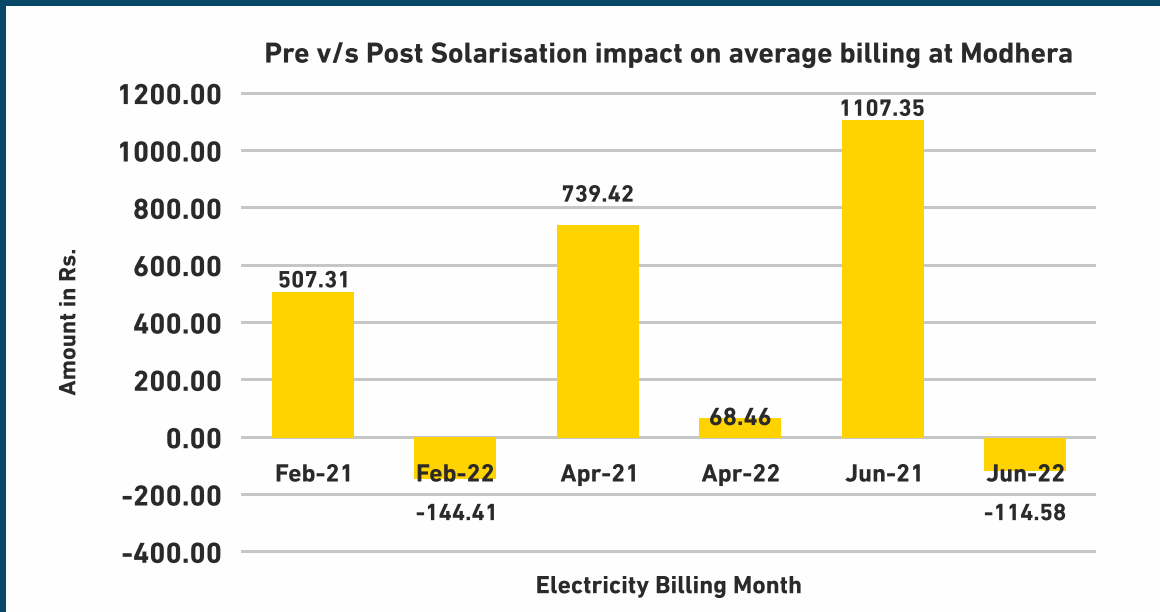
Government buildings are made self-sufficient by installing **316 KW capacity solar roof top systems**



Usage of electric vehicles is being encouraged through ultra-modern Solar Energy based **electric vehicle charging station**



Analysis of households before and after Rooftop Solarisation



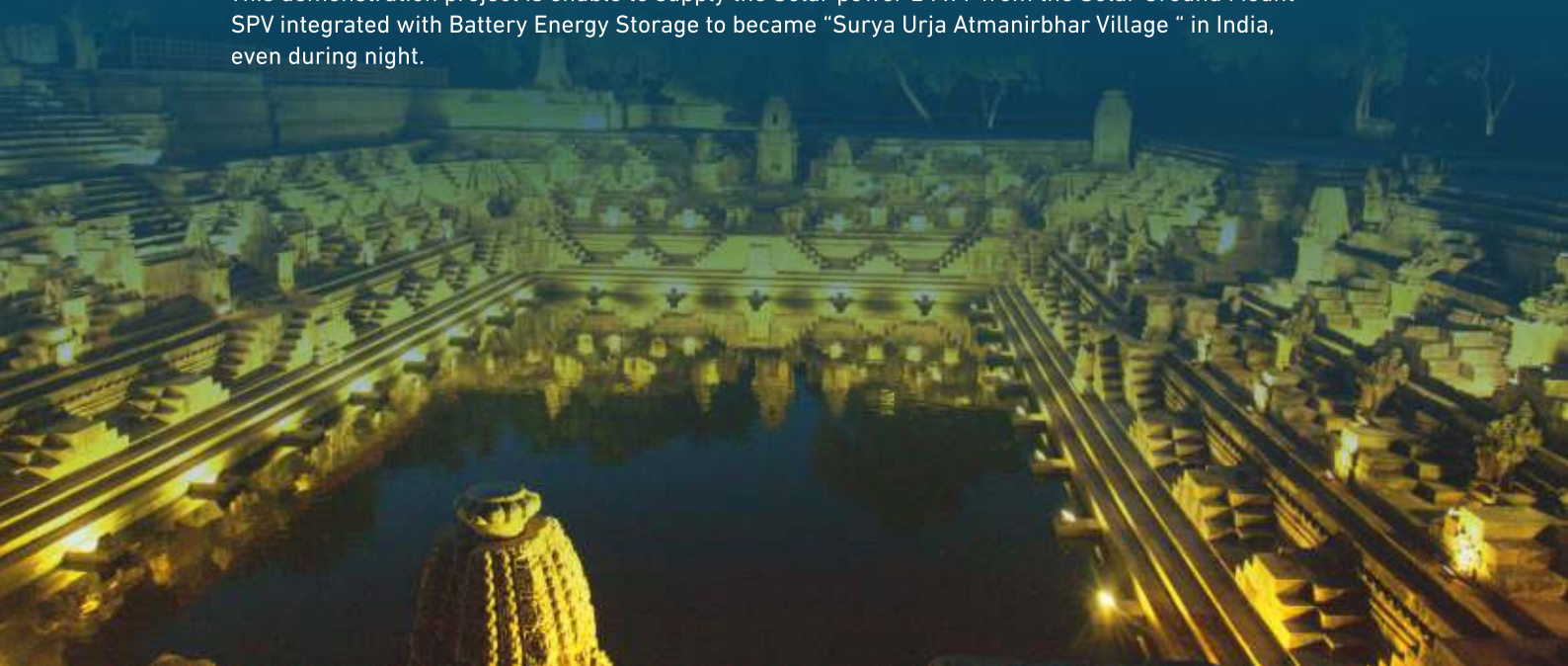
- Post installation of solar rooftop systems all villagers and government buildings at Modhera get financially benefited by paying low electricity bills.
- Furthermore, the villagers and government buildings become green energy generators.

Village Demand (kWh)	Supply BESS+PV (kWh)	Supply Rooftop (Residential) (kWh)	Supply Rooftop (Govt. buildings) (kWh)	Supply Carport (kWh)	Supply From Grid (kWh)	Solar PV Generation (kWh)
333546	286032	30012	8459	9012	31	1067765

(*for the month of may 2022)

Modhera village is first village in India to have round the clock solar energy

- Entire day time load demand of village is supplied through Solar project directly and then night time demand is catered through Battery energy storage system. The analysis shows that hardly 0.01% is drawn from the grid to cater demand of village. It is also to note that the load of Modhera village is also included in village demand.
- This demonstration project is enable to supply the Solar power 24 x 7 from the Solar Ground Mount SPV integrated with Battery Energy Storage to became "Surya Urja Atmanirbhar Village " in India, even during night.



Words that illuminate the happiness generated



“ We have benefited a lot from solar. Earlier my light bill used to be high in the whole society, but today we sleep in the air conditioner all night. Before solar people did not believe but now everyone is taking advantage of it.

Ramila Ben, Village Modhera



“ We have benefited a lot from solar. The bill which used to come Rs.1000-2000 rupees earlier, now on reverse we are receiving Rs. 200- 300 credit in our electricity bill.

Dahyabhai Modhera, Village Modhera



“ Solar rooftop has been installed in our school. Our school has 10 smart classes, 10 projectors and 22 rooms with 4 fans and 4 tube lights, its bill used to be Rs 4500 to 5000, but today the billing has stopped due to the installation of solar panels and in the last 6 months 16-17 thousand rupees credit in our electricity bill.

Mahendra Bhai Nai, Principal, Modhera Anupam School



“ We have benefited a lot from the solar panels. Earlier we used to receive huge electricity bills; but nowadays, we don't have to pay anything at all. I want to say, "Thank you!" to Modi Ji.

Rutvi Patel, Amarpura Vas, Village Modhera



“ The whole village has benefited, including me after the installation of Solar PV Panels. Earlier, we used to pay for electricity; but now we do not have to pay anything. We have received freedom from the hassle of paying electricity bills, thanks to Solar installations.

Bipin Patel, Village Modhera





By Train

Nearest Railway Station is Mehsana. The distance from Mehsana Railway Station to Modhera is 27 Kms.



By Road

The distance from Ahmedabad to Modhera is 101 Kms and is covered in nearly 2 hours. The distance from Mehsana is 26 Kms.



By Air

The airport closest to Modhera is the Sardar Vallabhbhai Patel International Airport in Ahmedabad.

