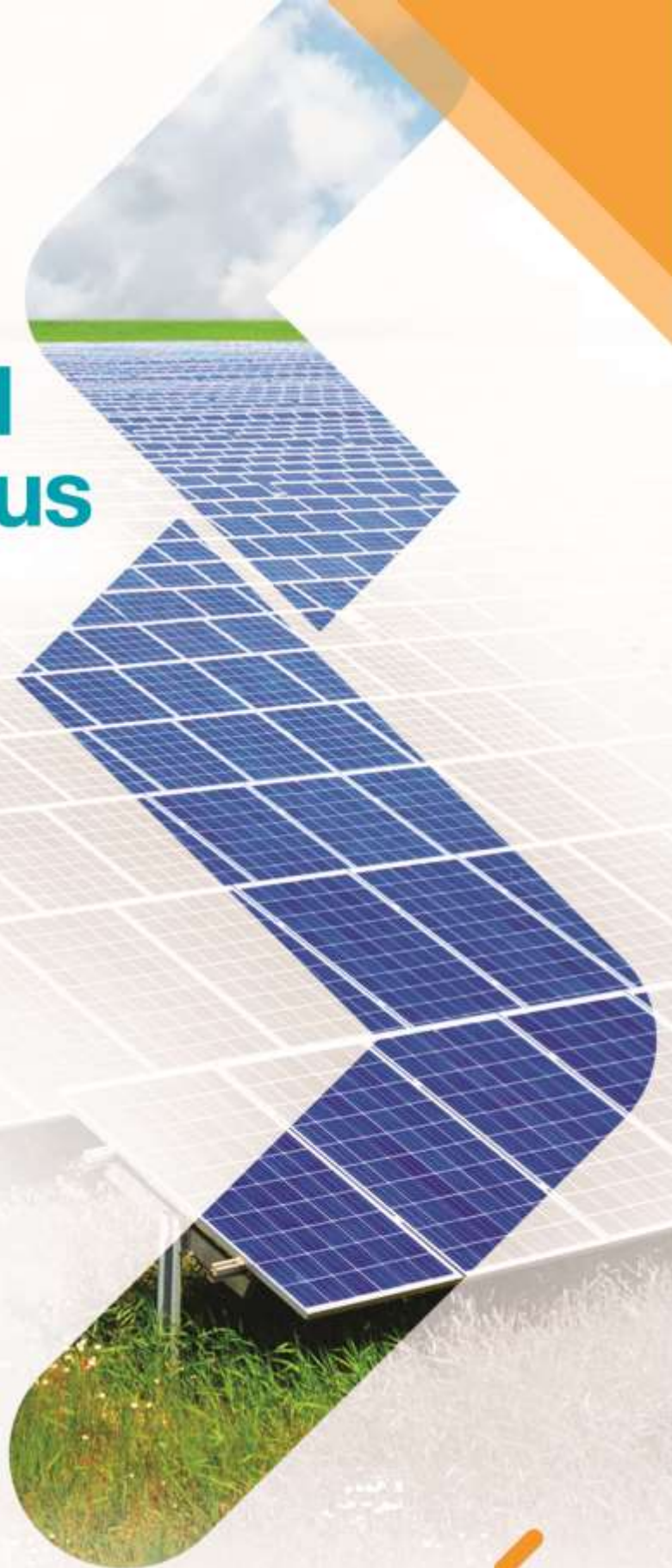


**Moving ahead  
with continuous  
innovation**



**susten**   
By Mahindra

energy build solutions engineering



# About Mahindra Group

The Mahindra Group focuses on enabling people to rise through solutions that power mobility, drive rural prosperity, enhance urban lifestyles and increase business efficiency.

A USD 16.5 billion multinational group based in Mumbai, the Mahindra group employs more than 200,000 people in over 100 countries. It operates in the key industries that drive economic growth, enjoying a leadership position in tractors, utility vehicles, information technology, financial services and vacation ownership. In addition, Mahindra enjoys a strong presence in the agri- business, aerospace, components, consulting services, defence, energy, industrial equipment, logistics, real estate, retail, steel, commercial vehicles and two wheeler industries. In 2014,

Mahindra featured on the Forbes Global 2000, a comprehensive listing of the world's largest, most powerful public companies, as measured by revenue, profit, assets and market value. The Mahindra Group also received the Financial Times 'Boldness in Business' Award in the 'Emerging Markets' category in 2013.



## About Mahindra Susten

Utility Scale Solar 

Distributed Solar  

Build Solutions 

Mahindra Susten (formerly known as Mahindra EPC) is a portfolio company of Mahindra Partners, the USD 900 Million private equity division of the USD 16.5 Billion Mahindra & Mahindra Group. Mahindra Susten offers a range of diversified services within the Cleantech space.

A leading player in the Indian solar energy sector, with over 350 MW of projects at various stages of execution, Mahindra Susten's services spans across Utility Scale Solar, Distributed Solar and Build Solutions. In addition, we also offer value added services like Design, Engineering, Operation, Maintenance and Analytics for Solar PV plants. Our Build solutions division offers turnkey design-build solutions for the Industrial and commercial sectors.

Our expertise in design, engineering, construction, procurement and latest industry know-how has made us a leader in this space. With our project portfolio, we are proud to have emerged as the largest solar EPC company in FY15. Our focus on execution excellence and quality ensures that Mahindra Susten goes beyond the contract and constantly delivers customer delight!



# Utility Scale Solar



Project Development



Turnkey EPC



Project Management



O&M



Analytics

Our customers today are proud owners of some of India's finest plants with 2% - 5% higher generation as compared to other similar solar PV plants.

In-house design and engineering team, efficient construction teams, and deep industry & technology know-how are our forte. Our customers also enjoy the benefits of the advisory services that help them understand and gain clarity on aspects of financing,

policies, land, fiscal benefits, and regulatory approvals to successfully install solar power plants. Mahindra Susten goes beyond the contract and provides value engineering to ensure that customers reap the maximum benefits.

Mahindra Susten has commissioned 100 MW of projects to date; which include Utility scale solar, rooftop solar, telecom tower solutions, DG - PV hybrid to mention a few. With over 250 MW projects under execution Mahindra Susten is poised to be the largest EPC player in India for FY15.





# Reference Projects

## 33 MW Jodhpur, Rajasthan



**Developer:**  
Mahindra Suryaprakash  
(JNNM Ph 1 – Batch II)

**Project Duration:**  
128 Days  
**Technology:**  
Cd-Te Thin film  
**Generation:**  
48.79 Mn Units / Year

## 5 MW Jodhpur, Rajasthan



**Developer:**  
Mahindra Solar One  
(JNNM Ph 1 – Batch I)

**Project Duration:**  
101 Days  
**Technology:**  
Poly crystalline with  
single axis tracker  
**Generation:**  
9.16 Mn Units / Year

## 2 MW Lucknow, Uttar Pradesh



**Developer:**  
Technical Associates  
(RPSSGP)

**Project Duration:**  
71 Days  
**Technology:**  
Cd-Te Thin film  
**Generation:**  
3.5 Mn Units / Year

## 6.91 MW Phalodi, Rajasthan



**Developer:**  
J.K. Lakshmi Cement  
(REC)

**Project Duration:**  
176 Days  
**Technology:**  
Poly crystalline  
**Generation:**  
10.36 Mn Units / Year

## 23 MW Bikaner, Rajasthan



**Developer:**  
Fonroche Energy  
(JNNM Ph 1 – Batch II)

**Project Duration:**  
112 Days  
**Technology:**  
Cd-Te Thin film  
**Generation:**  
38.27 Mn Units / Year

## 2.34 MW Hyderabad, Andhra Pradesh



**Developer:**  
Heritage Foods  
(REC)

**Project Duration:**  
117 Days  
**Technology:**  
Poly crystalline  
**Generation:**  
3.85 Mn Units / Year

## 2.13 MW Madurai, Tamil Nadu



**Developer:**  
MM Forgings  
(REC)

**Project Duration:**  
88 Days  
**Technology:**  
Poly crystalline  
**Generation:**  
3.33 Mn Units / Year

## 1.07 MW Madurai, Tamil Nadu



**Developer:**  
Super Auto Forge  
(REC)

**Project Duration:**  
88 Days  
**Technology:**  
Poly crystalline  
**Generation:**  
1.67 Mn Units / Year

# Distributed Solar



The Distributed Solar division at Mahindra Susten focuses on decentralized deployment of Solar PV power for on-grid and off-grid applications.

## Solar Rooftop

Rooftop solar installations are quick, easy and cost-effective solutions for solar power generation and contribute to reducing carbon footprint

Mahindra Susten provides design, engineering, procurement and construction of Rooftop Solar PV Power plants from a few KW to MW scale. With capability for both stand-alone and grid-connected Solar PV Power plants, Mahindra Susten has commissioned over 5 MW of solar rooftop solutions till date.

We have experience in all types of PV modules (poly-crystalline, mono-crystalline and thin-film) and have installed on both RCC roofs and metal roofs.

We also offer industry-leading 24x7 remote monitoring and diagnostics on our proprietary platform.



Rooftop projects find extensive applications for:

Individual Homes | Corporate Offices | Shopping Complexes and Malls | Industries and Plants | Institutions

## Reference Projects

### 1000 KW, Mumbai



**Client**  
IIT Mumbai

**Salient Feature**  
Non penetrating structures, Project on 15 roofs

**Technology**  
Poly-crystalline

### 660 KW, Baroda



**Client**  
Schott Glass

**Salient Feature**  
Unique rooftop mounting system

**Technology**  
Thin-film

### 392 KW, Hyderabad



**Client**  
Infosys

**Salient Feature**  
Car port on 7th floor, Modules at 3 meters height

**Technology**  
Mono-crystalline

### 250 KW, Chennai



**Client**  
Super Auto Forge

**Salient Feature**  
Light weight Aluminium structure, DG-PV Hybrid

**Technology**  
Poly-crystalline

### 212 KW, Mangalore



**Client**  
Infosys

**Salient Feature**  
Non penetrating structures, High efficiency modules

**Technology**  
Mono-crystalline

### 23 X 5 KW, Assam



**Client**  
TERI

**Salient Feature**  
Battery based power pack for rural health centers

**Technology**  
Poly-crystalline

### 66 KW, Nashik



**Client**  
Mahindra & Mahindra

**Salient Feature**  
Car port, DG-PV Hybrid

**Technology**  
Poly-crystalline

### 16.2 KW, Pune



**Client**  
Jabil Circuits

**Salient Feature:**  
Dual axis - azimuth tracker

**Technology**  
Mono-crystalline



## DG PV Hybrid

Mahindra Susten's DG-PV Hybrid is a solution that seamlessly integrates diesel generators with solar PV power, through the patented MACX™ controller. MACX™ is an advanced controller unit which intelligently communicates with load and power generation, maximizing the utilization of solar power.

Our DG-PV Hybrid solution has the highest photo-voltaic penetration ratio (PV capacity to diesel capacity) in the industry, of over 80%.

### Features:

- System size from 5 KW to 1 MW
- Reduces cost of electricity by prioritizing solar over diesel generator and grid
- 100% system stability and reliability guaranteed
- Modular design with provision to add components like battery backup and additional diesel generators
- Flexibility to operate with grid, multiple diesel generators and battery configurations
- 24x7 remote monitoring and diagnostics on Mahindra's propriety software

### Reference Projects:

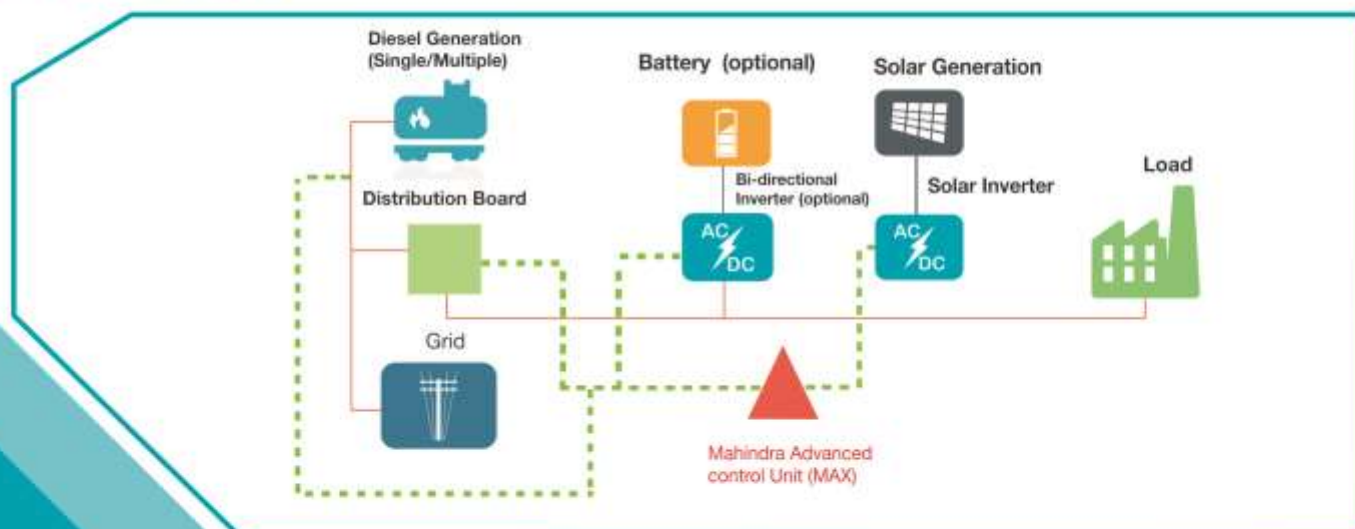
- 66 KWp, Igatpuri, Maharashtra
- 250 KWp, Chennai, Tamil Nadu
- 25 KWp, Shimla, Himachal Pradesh



### Technical Specifications for 15 KWp

Solar Modules	
Technology	17 KWp
Power Tolerance	Poly c-Si/Thin film
Inverter	
Capacity	15 KW AC
Efficiency	> 97%
Voltage Output	415 AC (3-phase)
Mahindra Advanced Controller (MACX™)	
Response Time	< 100 millisec
LCD Display	Yes
Remote Monitoring	Yes
Balance of system	
Structure weight	65 kg/m <sup>2</sup>
Solar DC Cable	EBXL-XLPO solar rated cable (80m)
AC Cable	XLPE insulated power cable (50m)

### Block Diagram



## Micro Grid

Mahindra Susten's Micro Grid solution is an intelligent power solution that ensures power is available to customer 24x7. It caters to varying loads at both urban and rural locations. The solution monitors load profiles and controls power demand, matching it to the power generation.

### Features:

- Load segregation and load side management
- Design of distribution network incorporating individual home metering
- Maximum uptime with remote monitoring and intelligent automatic switching
- 100% system stability and reliability



## Solar Telecom Tower

Mahindra Susten's Solar Telecom solution is a DC power solution that works with grid, diesel generator and battery systems both at brownfield and greenfield sites. Mahindra Susten has completed over 1000 installations where the towers used to run completely on diesel generators, our solution has reduced diesel consumption by 84% at these sites.

### Features:

- Maximum uptime and flexible design that works with grid, diesel generators and battery back-up
- Advanced Battery Management System (BMS) with priority to solar
- Remote monitoring analytics and diagnosis

## Technical Specifications

Component	Specification
Solar capacity	4.4 kW or 7 KW
Advanced controller	MACX™
GI structure	6 or 9 module and 1 or 2 pole structure
Civil foundation	Piling
Feasibility study and engineering design	Done post site assessment
Remote monitoring and control unit	Mahindra proprietary solution





## Solar Generator

Mahindra Susten's proprietary plug and play solar generator provides energy access to residential and commercial customers. A Grid-interactive 2KWp power producing solution, comes with an inbuilt 5KWh battery backup and 2 KVA PCU all packed in one set! The intelligent generator can easily export surplus solar power back to the grid where net metering is permitted. It cost-effectively can replace a 2KVA DG set and supply reliable power at negligible maintenance cost.



### Technical Specifications:

Component	Specification
Solar capacity	2 KW
Module dimensions (L x W)	4953 X 3010 mm
Output Voltage	230 V, Single Phase
Battery type	Lead Acid
Battery Output	5 KWh
Canopy dimensions (L x W x H)	1400 x 950 x 950 mm
System weight	640 Kg

### Features:

- Easy to install – Unique plug and play technology
- Supreme performance
- Negligible maintenance cost
- In house developed, superior remote monitoring technology (optional)

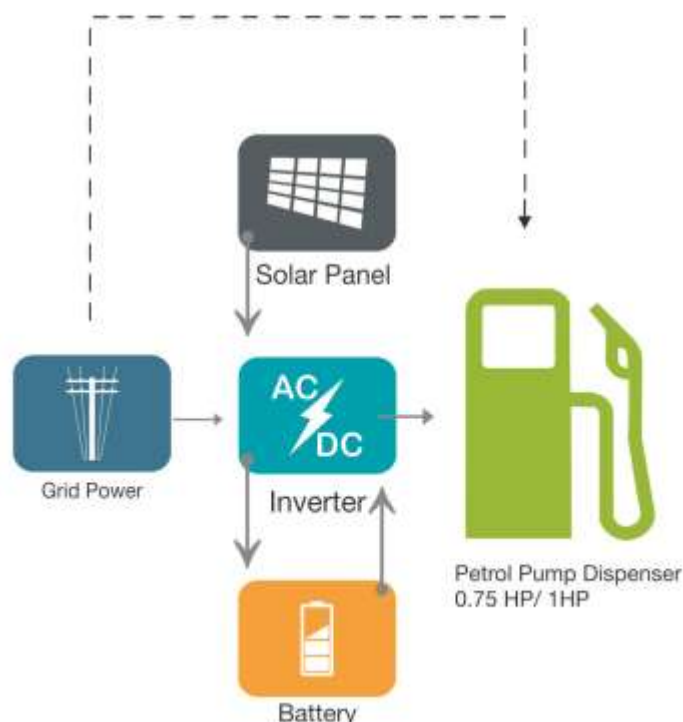
## Solar Petrol Pump Solution

Say good bye to erratic power cuts and expensive diesel generators. Mahindra Susten offers intelligent, reliable and economical power backup solution for petrol pumps. These battery-based intelligent solutions serve as a low-cost alternatives to diesel generators and supports your daily power needs. The solution allows you to operate upto 10 nozzles and lights with upto 3.5 hours of battery backup\*

### Technical Specifications

PV Size (W)	PCU Rating (VA)	Battery Hours (Ah)
1040	2000	100 Ah @ 48V
1560	3000	160 Ah @ 48V
2600	5000	160 Ah @ 96V
4680	8000	200 Ah @ 96V
5460	10000	200 Ah @ 120V

may increase or decrease depending on the load supported.



## Solar ATM Solution

Now run your ATM Kiosks uninterrupted with Mahindra Sustens' solar ATM solution. These solar power packs can be easily retrofitted with existing ATMs and kiosks. The solutions range from 40W to 1kW and are easily customizable depending on site locations. With upto 4 hours of battery back up\*, these solar ATM solutions are a perfect fit for rural and semi-urban areas where space is limited and power is erratic.

may increase or decrease depending on the load supported.



# Build Solutions

The Build solutions division at Mahindra Susten offers turnkey design & build solutions for the Industrial and Commercial sector. We aspire to be India's first green

EPC company that goes beyond certifications to make buildings and factories which are truly sustainable. Our focus is on growing industrial segments such as pharmaceuticals, food products, breweries, automotive and medical and institutional establishments.



**We offer turnkey design & construction solution to build sustainable LEED certified factory buildings for you**

## Value Proposition

- Delivery excellence within record time
- Innovation driven design and execution
- Inclusive approach benefitting all stakeholders



Single point  
of responsibility



Lower  
project cost



Focus on  
Sustainability



Minimize  
risk



Quicker project  
delivery





## Our Portfolio Projects

### Fertilizer Formulation Plant, Ankleshwar

Scope of work - Civil Work

Development Area - 1,50,000 Sq.ft



### Regional Distribution Centre, Spares Business Unit, Jaipur

Scope of work - Civil and structural EPC

Development Area - 3,22,000 Sq.ft



## Flexible, tailored and customized services

End to End Solutions provider with flexible offerings

### SPECIALTY SERVICES

Architecture - Concept  
Pre-Design - Detailed Design

Foundation &  
Civil Design

MEP Services &  
Speciality HVAC

Process Design &  
Optimization

### SUSTAINABLE SERVICES

#### Energy Analysis & Modelling

- Embodied Energy Analysis
- Harmonics Analysis
- Conceptual Energy Modelling
- Sun path Analysis
- Day lit Building
- Net Zero Energy Designs
- Renewable Energy Modelling

#### Water Management

- Water Self Sustainable Designs
- Rain Water Harvesting
- Recycling & Reuse - Zero Water Discharge
- Net Zero Water Designs
- Ecological Water Flow Assessment

#### Sustainable Construction

- Material Conservation
- Waste Reduction
- Outdoor Air Quality
- Labour Health & Safety



Industrial Buildings



Commercial & IT Park



Healthcare & Pharma



Food & Beverages

### Why Go Green?

GREEN =  
PREMIUM;  
IS NOW  
**DEBUNKED**

• **Decrease your "Operating" Expense** We make sure that the green offerings decrease the overall operating expense for you. We will tailor green investments for you that bring down your energy, and water consumption. Most investments into green shall have short pay backs of three years or less thereby creating immense value.

• **Positively "Impact" the Environment** It will be our endeavour to minimize the impact to the environment for both the construction phase and the operational phase of the building. Decreasing the pollution and water discharge, using local materials for construction, saving the existing bio-system are some of the initiatives we take to create a healthy environment around us.

• **Increase "Productivity" in your premises** We specifically focus on the well being of people who occupy the factory building. High standards of Indoor air quality by innovative ventilation & efficient HVAC, design & automation to minimize human fatigue are some of the initiatives we take to increase the feel good factor and productivity of the building occupants.

• **Brand Green, earn goodwill** Green is also a statement that you could make to all your stakeholders, to make them know that you care about them and for the world around you. Brand green to earn respect and support from your employees, promoters, customers and the community as a whole.



# Mahindra Susten Footprints







#### Head Office - Mahindra Susten

C/O Mahindra EPC Services Pvt. Ltd.  
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#### Regional Office - Mahindra Susten

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