



SOLAR

WE **DO** IT ALL

Ground, Rooftop, Water, Space

Think Solar Think BHEL

About BHEL

BHEL is a celebration of India's industrial achievements. Established in 1964, it is one of India's largest engineering and manufacturing enterprises in the energy and infrastructure sectors and a leading power equipment manufacturer globally.

BHEL serves the core sectors of the economy and provides a comprehensive portfolio of products, systems and services to customers in power, transmission, transportation, renewables, water, defence & aerospace, oil & gas and industry from its widespread network of 16 manufacturing plants, 2 repair units, 4 regional offices, 8 service centres, 15 regional marketing centres, 3 overseas offices and more than 150 project sites across India and abroad. In all, BHEL has footprints in 83 countries in all the six inhabited continents.

The worldwide installed base of power generating equipment supplied by BHEL exceeds 185 GW- making it the undisputed leader amongst Indian power plant equipment manufacturers. BHEL has installed more than 1000 utility sets in thermal, hydro, nuclear & gas based power plants, contributing 53% to the total installed conventional power generation capacity in the country.

All the entities of the company are accredited to ISO 9001:2015, Quality Management Systems, with major manufacturing units also accredited to Environmental Management Systems, ISO 14001:2015, and Occupational Health & Safety Management Systems, OHSAS 18001:2007.



100 kW Grid-interactive Solar PV Plant at Lakshadweep



35+
years
of solar
experience

1,198
MW
Solar Portfolio

105
MW
Cell Manufacturing
Capacity

226
MW
Module Manufacturing
Capacity



NTPC 5x50 MW solar PV plant at Kadiri - 50 MW EPC by BHEL

Harnessing the Sun ... since 1983

BHEL is one of the first engineering enterprises to manufacture solar photovoltaic (SPV) cells and modules in the country and was successfully able to demonstrate its capability even before the solar sector witnessed active growth and development in India.

Since then, BHEL has been continuously developing its solar portfolio and today, is one of the few companies in India which provides end-to-end in-house solutions for all solar power needs - including conceptualisation, design, engineering, manufacturing, erection, testing, commissioning and O&M - with proven expertise of over three decades.

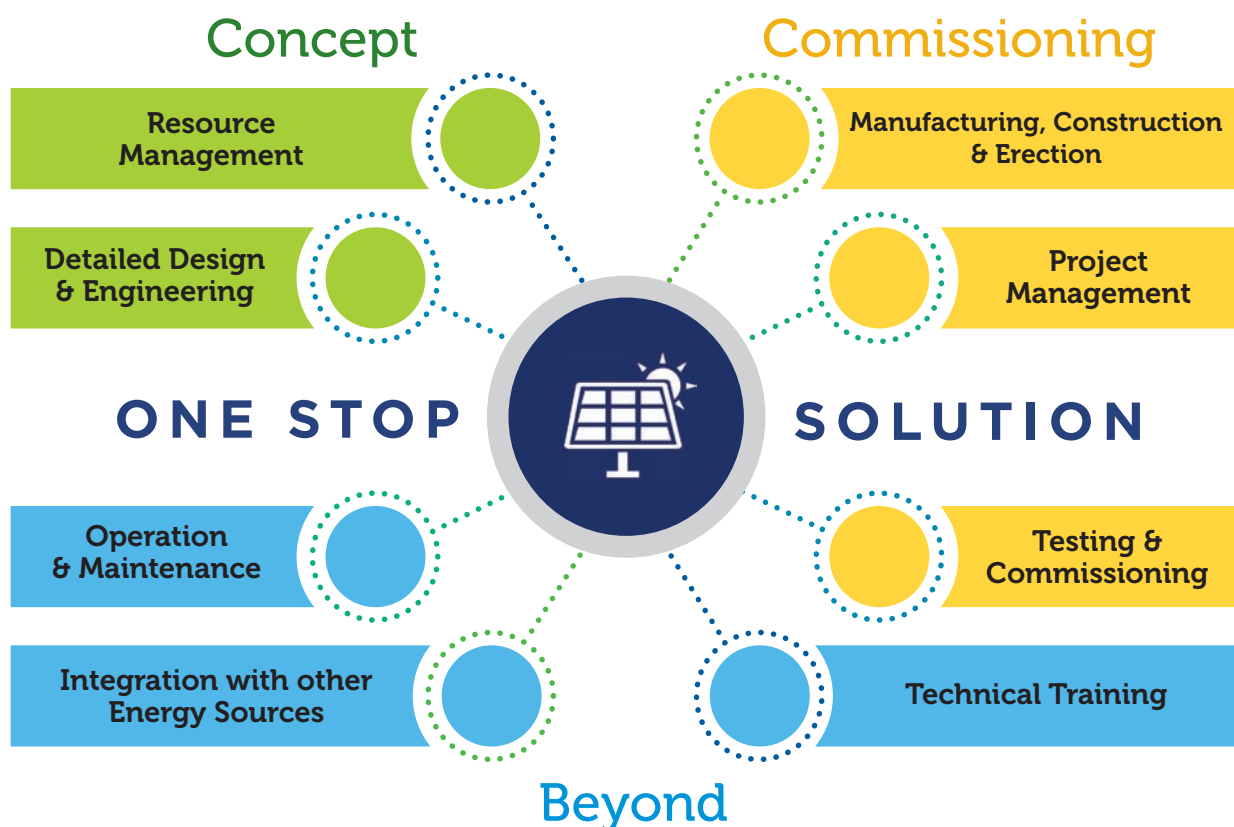
Solar on ground, solar on rooftop, solar on water to solar in space - **We do it All !**

With state-of-the-art manufacturing facilities, best-in-class cell efficiency, a dedicated R&D centre and proven quality, support & assurance - BHEL is a one-stop solution for all your solar power needs.



Concept-to-Commissioning and Beyond...

Practicing the philosophy of concept-to-commissioning and beyond, our endeavour is to provide customer-oriented cost-effective solutions and services for the whole spectrum of solar energy.

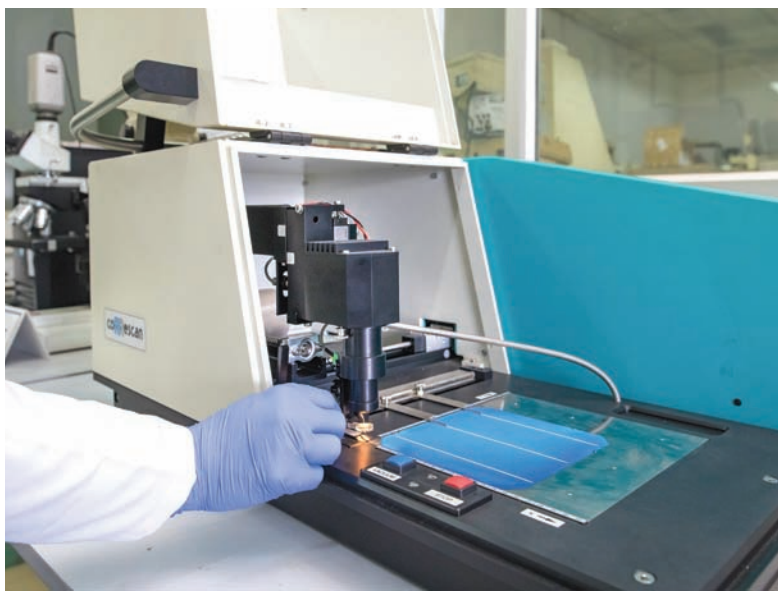


Manufacturing Capability

BHEL manufactures high-efficiency mono and polycrystalline silicon PV modules in its state-of-the-art production facility at Bengaluru. It is the only enterprise in India which possesses the capability of developing and manufacturing almost the entire range of equipment for solar PV plants, comprising:

- Cells - Mono/Polycrystalline
- Modules - Mono/Polycrystalline
- SCADA (Supervisory Control & Data Acquisition) System
- Solar Inverters (630 kW/1250 kW)
- Switchgear Panels (all kV ratings)
- Power Transformers (15 MVA and above)
- Passive Solar Tracking System

In addition to the above, BHEL has a dedicated facility for manufacturing space-grade panels and batteries.



Research & Development

BHEL has a dedicated industrial R&D Centre for PV at its Amorphous Silicon Solar Cell Plant (ASSCP) in Gurugram, Haryana. The centre is equipped with state-of-the-art facilities and testing characterization equipment. Its R&D team is engaged in developing high-efficiency silicon(Si) solar cells and process optimization.

At its R&D facility, BHEL has invented innovative and easy to use testing and process tools which include among others, single side etcher, diffused reflectance setup, calibration setup, plasma texturing setup, etc.

BHEL has also developed Passive Tracking System and the same is under field trials.

WE IT ALL



Ground Mounted

Customer-centric large scale utility power plants integrated with megawatt sized battery energy storage system (BESS).

Major References

Commissioned

- 75 MW SPV plant at GIPCL Charanka, Gujarat
- 65 MW SPV plant at NLC, Neyveli, Tamil Nadu
- 50 MW SPV plant at NTPC Kadi, Andhra Pradesh and another 50 MW SPV plant at NTPC Mandsaur, Madhya Pradesh

Rooftop

- Rooftop portfolio of **around 25 MW**
- Grid-connected systems with net metering
- Hybrid with D.G. & Grid-synchronized systems
- Off-grid with battery backup

Major References

Commissioned

- 3.6 MW SPV plant, Surat Municipal Corporation, Surat - Gujarat
- 2 MW SPV plant, Indian Railway Organization for Alternate Fuels, DMW, Patiala - Punjab
- 1.5 MW SPV plants, ONGC Assam
- 1 MW SPV plant, Ordnance Factory (Rifle Factory), Ishapore - West Bengal



Canal Top

- In-house design and development of module mounting structure suitable for canal tops
- Patented design of BHEL makes optimum use of canal top space with a tiltable design
- Innovative concept of merging cable tray, walkway, fencing and illumination posts into the girder have reduced civil works, thereby increasing the viability of this design
- India's first seasonal-tilt canal top SPV plant of 1 MW capacity commissioned by BHEL at Bhimavaram, Andhra Pradesh



Floating Solar

- **219 MWp Floating SPV plants under execution**
- BHEL designed floating SPV power plants can be installed on City lakes /Reservoirs of hydel power Plants/Drinking /Irrigation water ponds
- The design uses recyclable, UV and corrosion-resistant HDPE (High density poly ethylene) floats

Solar Pumps

- Solar based water pumping systems for irrigation and drinking water purposes
- Supplied solar based water pumping systems in various villages of Punjab and remote locations of Arunachal Pradesh
- Major customers include M/s PEDDA (Punjab Energy Development Agency), M/s APEDA (Arunachal Pradesh Energy Development Agency), M/s GWSSB (Gujarat Water Supply and Sewerage Board)



Space Grade Solar

- BHEL is the exclusive supplier of space-grade panels and batteries to ISRO (Indian Space Research Organization) for their space programs since 2001



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Powering Progress...Brightening Lives. Touching Every Indian Home