



RENEWABLES SOLAR

Think Solar | Think BHEL

About BHEL

Since 1964, BHEL has been 'Making in India' as a leading Capital Goods sector company. Today, the company's businesses are in the areas of power and industry, offering comprehensive solutions, including products, systems and services to power generation (thermal, hydro, gas, nuclear and solar PV), transmission, transportation, defence, aerospace, oil & gas and other core sectors of the country, and also abroad. BHEL, incorporated as a Public Sector Undertaking of the Government of India with a shareholding of 63.17%, has established 16 manufacturing plants spread across India, producing capital goods for the customers in domestic as well as international markets. The Company has steadily expanded its product portfolio through both partnerships with global OEMs as well as in-house product development. The in-house product development is backed by consistent investment of more than 2.5% of revenue on R&D and innovation. At BHEL, we firmly believe that serving our customers, protecting the environment, and contributing to society are intrinsically linked, and form the core of our corporate ethos. The Company has been supporting communities through programs like skill development; promoting health, hygiene & education; and running several programs on environmental protection & improvement.



35+
years
of Solar
experience

1,225+
MW
Solar Portfolio

85
MW
Cell Manufacturing
Capacity

226
MW
Module Manufacturing
Capacity



NTPC 5x50 MW solar PV plant at Kadiri (Andhra Pradesh)- 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.

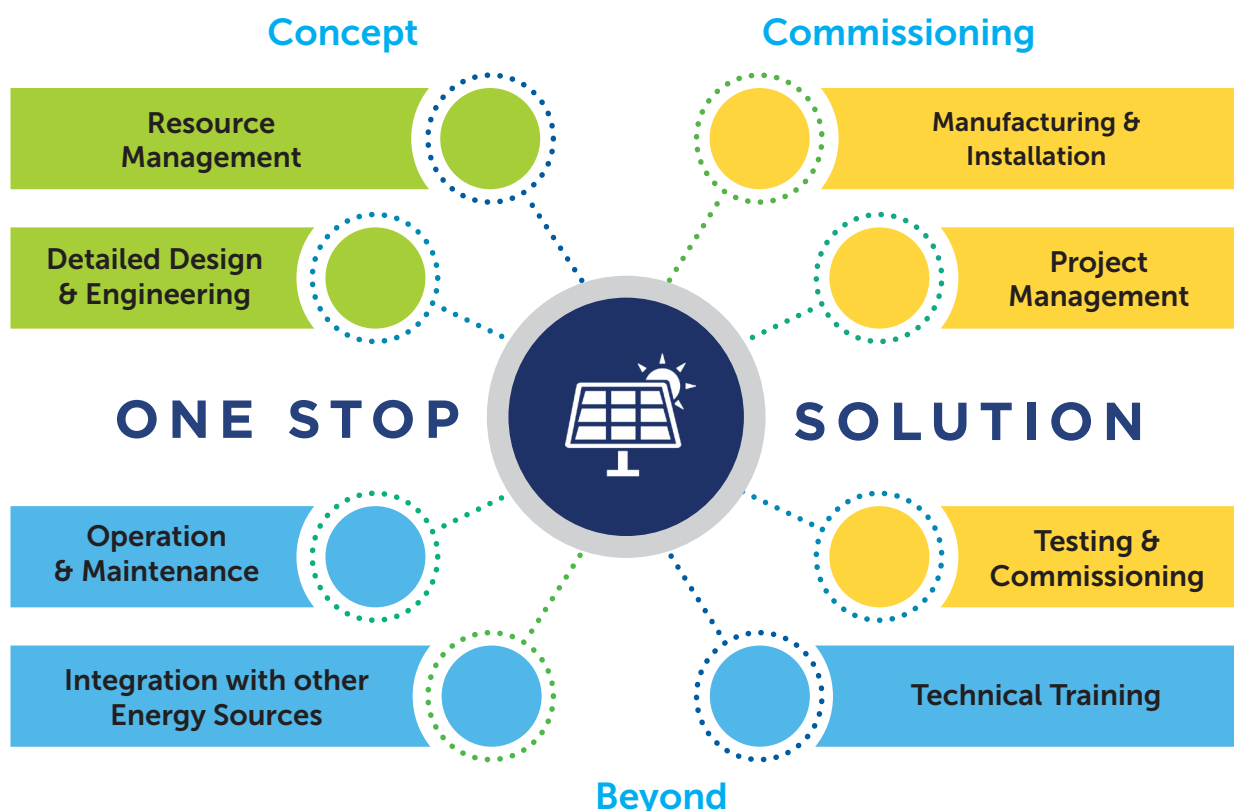
Solar on ground, solar on rooftop, solar on water to solar in space - **We do it All !**

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.

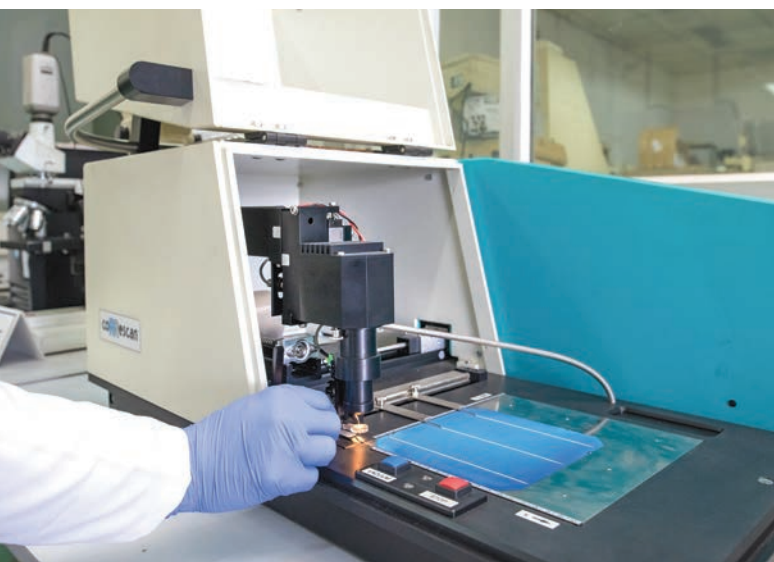


Manufacturing Capability

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 developed 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 has successfully demonstrated the same in MW rating solar PV projects.

Ground Mounted



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

Major References

Commissioned

- 100 MW SPV plant at GSECL, Raghanesda Solar Park (I), Gujarat
- 75 MW SPV Plant at GSECL, Dhuvaran, Anand, Gujarat
- 75 MW SPV plant at GIPCL Charanka, Gujarat
- 65 MW SPV plant at NLC, Neyveli, Tamil Nadu
- 50 MW SPV plant at NTPC Kadiri, Andhra Pradesh and another 50 MW SPV plant at NTPC Mandsaur, Madhya Pradesh

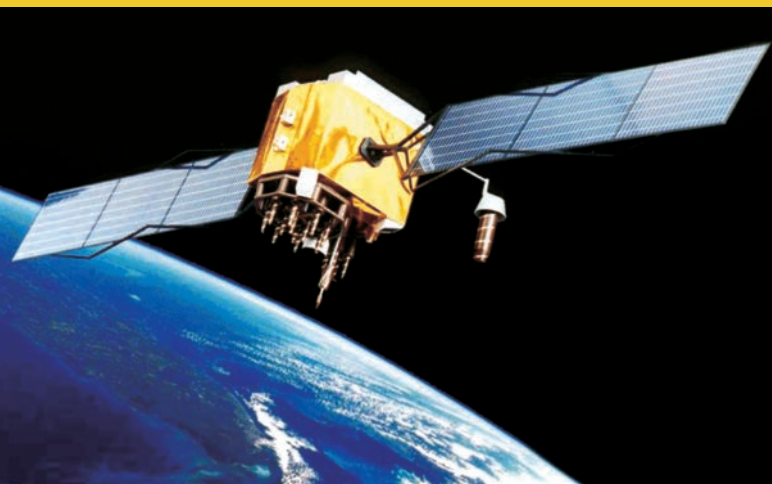
Floating Solar

Largest player in floating solar EPC segment in India

Major References

Commissioned

- 100 MW Solar PV Plant at NTPC, Ramagundam, Telangana (largest in India)
- 25 MW Solar PV Plant at NTPC, Simhadri, Andhra Pradesh
- 22 MW Solar PV Plant at NTPC, Kayamkulam, Kerala
- 5 MW Solar PV Plant at WBPDC, Sagardighi, West Bengal



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



Rooftop

- Rooftop portfolio of around 33 MW
- On Grid & Off Grid systems
- Distributed, Captive, etc.

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 has 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

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 PEDDA (Punjab Energy Development Agency), APEDA (Arunachal Pradesh Energy Development Agency), GWSSB (Gujarat Water Supply and Sewerage Board)





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