



PHOTOVOLTAICS: EMPOWERING THE NATION



FUTURE OF ENERGY: SOLAR

Energy is now the most valuable commodity for individuals as well as for the economy of a country. Among clean, sustainable and affordable energy sources, solar has emerged as the front runner and as per UN forecast almost 45-57% of world energy requirements will be fulfilled by solar only. Current scenario of price competitiveness of solar with coal and hydropower coupled with environmental benefits and ease of installation, solar power plants have become a reliable alternate power in most of the urban locations across the world.

As predicted by various energy stakeholders, demand for efficiency, easy financing, capacity building and performance evaluation are the key factors driving the energy economics. By 2030, it is estimated that renewable energy and specifically solar energy will grow at an average CAGR of 38-52% from 2017-2030. This enormous growth will open up millions of jobs majorly in technical, financial and commercial field.

ABOUT THE TRAINING

This training program is aimed at strengthening emerging energy manager and corporate decision makers in solar and renewable industry to understand the sector inside out.

The training is ideally comprised of 5 segments namely Energy overview, Solar Technical, Solar Financial and Commercial decision making, Policy & Regulation, Career Growth and Entrepreneurship. Depending on the needs of the audience this course can be customised, however, for better result a basic technical knowledge in power and finance is advised.

Details of syllabus and mode of delivery is explained in subsequent pages.

For professional training/ Guest lecture/ Customised training

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SPECIAL POINTS OF INTEREST

- Key business points
- Client and financier identification
- Closing a PPA deal
- Networking & career growth

FOCUS AREA

- SOLAR PV
- SOLAR THERMAL
- SOLAR PRODUCTS
- SOLAR PUMP
- CSP



TECHNICAL INTRODUCTION

- **PV Systems:** Understanding PV, Types, Applications, Technology
- **Solar PV System:** Types of System, Connections (Off Grid, On Grid, Hybrid)
- **Module:** Types, Quality, Working, Manufacturing, Performance Parameters, Installation, Cost & Companies
- **Inverter:** Types, Connection, Working, Performance, Parts, Companies, Installation, Cost, Power Evacuation
- **BOS:** Cable, ACDB, AJB, MPPT, Structure, Safety Devices
- **Battery:** Types, Uses, Analysis, Performance, Connection Types, safety, Installation
- **O&M:** SCADA, Cleaning, Maintenance, Quality Parameters, Warranty, Safety Standards
- **Load:** Understanding Electricity Bill, Calculation of Load, Types of Load, Load Matching, Safety Load to PV Matching, Loss estimation

Requirements: Basic knowledge of AC and DC power generation, transmission and distribution

“Solar power is not about fashion, its about survival. Sir Norman Foster”



SOLAR FINANCING

Solar power plants are capital intensive and are installed for almost 25 years. Financing innovations have helped fuel the exponential growth of the solar market in India as well as across the globe.

- CAPEX
- BOOT/ PPA

FINANCIAL AND COMMERCIAL

A successful business is the result of precise estimation and prediction of cash flow during the course of the project. A solar power plant is designed to have a normal working life of 25 years and with almost a 95% accuracy of generation estimation, cash flow estimates can be similarly accurate and mitigates risks.

- **Financial and policy benefits**

Capital Subsidy, Accelerated Depreciation, Net-Metering for Rooftop, Subsidy, Tax Benefits, VAT, Importing components

- **Proposal making and Market Research**

BOOT and CAPEX Models, Market Research and Analytics

- **Financial benefits and savings**

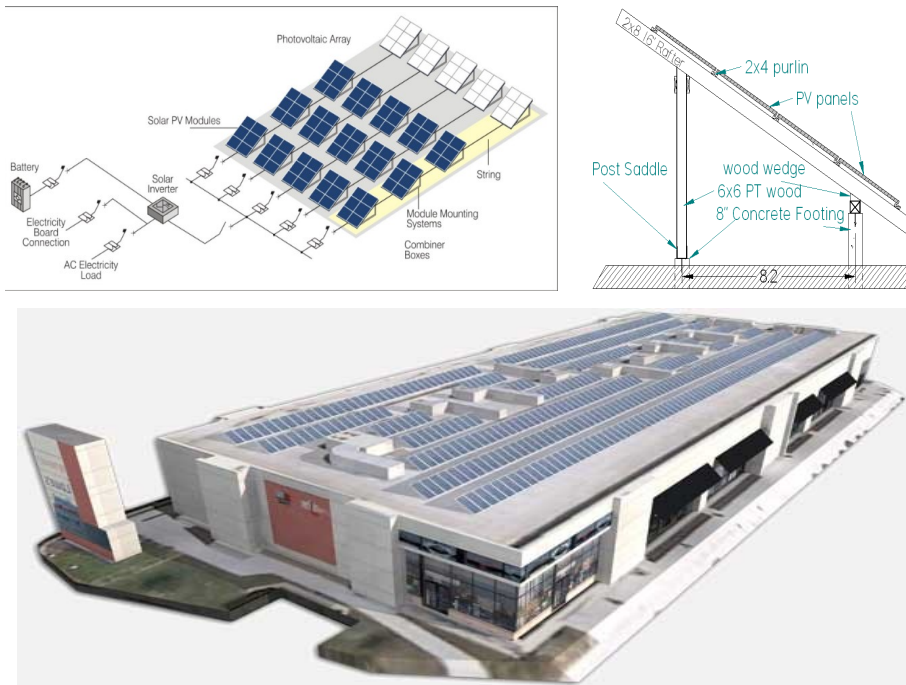
Generation estimate, PPA agreement, Payback, IRR, Tariff and cost escalation.

- **Financial and Technical risks**

Bank Guarantee, Performance Guarantee

Requirements: Basic knowledge of project finance and accounting

DESIGNING AND ANALYTICS



Solar power plants designing is one of the most crucial factors in project success. Solar power plant designing involves use of various software's, tools, data, and image to estimate generation prediction, capacity optimisation, feasibility of location, available capacity, remote monitoring, and accident prevention.

- **Technical drawing/designing**

SLD, Roof Layout, Completion Report, BOQ, BOM, Material Procurement

- **Softwares**

PV SYST, PV SOL, Sketch Up, Google Earth Pro, AutoCAD, MSP

TENDERING & BIDDING

- **SECI Tenders**

Understanding tender documents, RFP and RFQ documentation

- **Institutions and Organisations**

Understanding roles, responsibilities, functions and scope of various organisations and institutes, govt bodies and associations of solar industry, government Initiatives.

SOLAR DESIGNING

Solar designing is the most crucial technical domain of Solar Power plants. Functions include:

- ◆ Converting raw data into usable data
- ◆ 3D model of roof
- ◆ Solar panel and structure mounting
- ◆ Optimizing panel mounting, shadow analysis
- ◆ Inverter mounting and cabling
- ◆ Safety devices and cable sizing
- ◆ Power evacuation routing,
- ◆ Load profiling
- ◆ Generation estimation
- ◆ BOM & BOQ

INSTITUTES/ AGENCIES

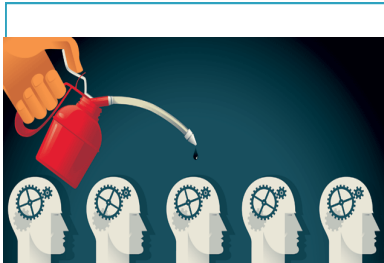
- ◆ MNRE
- ◆ SECI
- ◆ IREDA
- ◆ NISE
- ◆ MSME
- ◆ UK-REDA
- ◆ ISTSL





CARRER GRWOTH, ENTREPRENEURSHIP & FUTURE TRENDS

- **Job:** Current job opening, job requirements, common interview questions, Career growth and future scope, Best companies to join
- **Entrepreneurship:** MNRE empanelled companies, Starting a venture, Revenue Forecasting and Strategy Formulation
- **Future Trends:** Upcoming Technologies, Future Growth Opportunities and New Opportunities in Energy



Training Methodology

- Multi dimensional training
- Handouts to student for knowledge before session
- 2 day 9.5 hr course
- α) 4 sessions of 1.5 hr each
- β) 1.5 hr doubt clearing
- γ) 1 hr interview preparation



SASWAT SOURAV PANDA

Industry: Renewable Energy: Solar

Company: Sunshot Technologies

Position: Asst Manager

Dept: Sales Operations

Company: Winnerspitch Energy

Position: Sr Manager

Dept: Business Development

Industry: Market Research & Consulting

Company: Markets&Markets, TechSci Research

Dept: Petrochemicals, Energy & Power

Solar Trainer: PPDC Agra, Dept of MSME, Govt Of India

Solar Consultant: Vivanex Energy

BTECH: MECHANICAL, BPUT

MBA: INFRASTRUCTURE MANAGEMENT, UPES

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