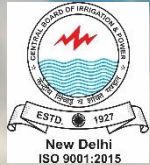


ONLINE CERTIFICATION COURSE IN “RENEWABLE ENERGY DEVELOPMENT INCLUDING GRID INTEGRATION AND ENERGY STORAGE SYSTEM”



ORGANIZED BY
Central Board of Irrigation and Power
CBIP Centre of Excellence

Starting Date: 30th January, 2023
(65 Hours Duration)



UNDER THE AEGIS OF
The Society of Power Engineer (India)

NODAL OFFICERS

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 **HYDROGEN**
ENERGY STORAGE



CENTRAL BOARD OF IRRIGATION & POWER
An ISO 9001 : 2020 Organization
CBIP CENTRE OF EXCELLENCE

(More than 9 decades Service to the Nation in Power, Water and Renewable Energy Sectors)

www.cbip.org , training@cbip.org

Feedback received from the participants from similar course conducted through Online.

Participants Feedback (From 1st Batch)

It was very Planned training that includes all the relevant topics in structured way. A very meaningful & cost – to money training program. Faculty was very knowledgeable in their subject. They explained from basics to the requirements of Industry. All sessions were very interactive & we had a great learning. We ensure to encourage others to join this skilled course

By Nitin Kumar Srivastava, (GE)

Appreciate the efforts of Team CBIP....Nice learning Experience.

By Shri P V Tayde, Govt. of Maharashtra

Nicely covered all the aspects of Solar, Wind and Energy Storage, great learning

By Shri Neeraj Verma, CSPGCL

Participants Feedback (From 2nd Batch)

We have gained good knowledge in the renewable filed. Hope in future also you will also keep us updated in the sector.

By Sumit Anand, Damodar Valley Corporation

Training was excellent, very knowledgeable and made feel confident in undertaking the practical part of the Renewal Energy.

By Dhanunjaya Salla, International Energy Technik (U) Ltd

Participants Feedback (From 03rd Batch)

RE Development Course is module in such a way that everyone who seeks to get into Renewable Business and already in will get benefitted from this course. One more important and USP of this course is the Faculty. Amazing Faculty with Huge amount of Experience in this domain and very interactive and industry driven course. I missed 1 lecture out of 40 odd and I felt bad about it. Its that kind of course. Go and Grab the Knowledge about Renewable

- By Rohan Barge, Aker Solutions

Dear CBIP Team,

Training feedback.....

First of all, it's a great honor to be part of this special course. I learned a lot, really. I am grateful to have the chance to participate in an online course like this.

I want to thank you & your team which was involved in the process of making this training session so productive. "I feel better equipped to manage after completing the course. This was my objective at the beginning. "

I would to extend a warm thank you for organizing an amazing training session. Not only the session was very informative, very insightful & interactive and the discussion were truly inspiring. Presentations were interesting, good slides and vedios that kept us all engaged. The training was absolutely superb and I genuinely enjoyed each and every moment of it. The content was extremely informative and incredibly useful.

"Fantastic Trainer, very friendly and encouraging. All of the exercises were on a scale of good to excellent. "

A wonderful experience and a handy course. The lecturers are great with a very nice way on interacting.

I'm so glad I enrolled in this course. I will surely recommend this training to all of my colleagues and friends.

Thank you so much once again. Despite my twenty two years of experience, I learned a lot from this course. I learned and benefited immensely from the course, as the course design is meticulously well planned.

**With Warm Regards,
Biswajeet Biswal**

Dear CBIP Team,

The training was a high mixture of experienced faculty, real time solutions, existing and upcoming technologies which gave us a vast knowledge of Solar, Wind and Battery systems. I am happy to be a part of this session. Looking forward for these type of trainings. A big Thank you for the team who made this training successful. All the best team members.

By K.Bala Gopal, NTPC LTD

Dear CBIP Team,

Thank you for organizing this course. The course was highly informative and designed for professionals working in/ willing to switch to renewable energy field. The transfer of knowledge lead by CBIP by coordinating with such experienced faculties has lead to enrichment of all the participants. In the end very well concluded. Thank you once again.

By Neeraj Kakkar

Dear CBIP team,

First of all I would like to express my heart felt gratitude to CBIP team for arranging this course. It was a great experience with very experienced and learned faculties. Though I could not attend live sessions regularly due to my nature of job, and other obligations, but the classes I attended was really very interactive and interesting. The ppts and the recordings received are very useful. The course was very well planned and structured with excellent faculties. It will be a great help to all who are in this field..

Looking forward to more illuminating courses on the advancement of energy transition scenario.

Best wishes to my fellow participants.

Thank you so much CBIP team specially Jaideep Sir. □□□

By Arundhati Mukherjee, DVC

Dear CBIP Team,

As we all know that, we have to reduce the Carbon Emissions and be "the net zero Greenhouse Gas Emissions by 2070" ..

Such courses will help each and every individual to assess how we can help in reducing the emission in our place of work (whatever it may be) ..

The course was highly informative and was perfect for boty professional working in Conventional Energy switching it into RE field and also for the RE Engineering Personnel to excel in their respective Field ...

The faculties organized by CBIP were highly intellectual and all of the doubts concerned to the topic were cleared in the most sublime way ...

Thanks to CBIP and request them to conduct such Professional Courses/Capacity Building Programs in near Future

**By Amit Kumar Saxena, Performance Optimization Group
MAHAGENCO**

Dear CBIP Team

To interact with people having 30-40 years of experience in Renewable Technology field is a great opportunity.

I hope CBIP shall continue to organize such courses in future also.

Overall a good learning experience.

Thanks Team CBIP.



INTRODUCTION

Government of India has set targets to reduce India's total projected carbon emission by 1 billion tonnes by 2030, reduce the carbon intensity of the nation's economy by less than 45% by the end of the decade, achieve net-zero carbon emissions by 2070 and expand India's renewable energy installed capacity to 500 GW by 2030.

- 45 solar parks of aggregate capacity 37 GW have been approved in India.
- Solar Parks in Pavagada (2 GW), Kurnool (1 GW) and Bhadla-II (648 MW) included in top 5 operational solar parks of 7 GW capacity in the country.
- The world's largest renewable energy park of 30 GW capacity solar-wind hybrid project is under installation in Gujarat.
- India offers a great opportunity for investments in RE sector; \$ 196.98 bn worth of projects underway in India.
- India ranked third globally for the total installed capacity of wind power (40.1 GW), behind China, the US and Germany.
- The Green Hydrogen Mission has expected outcome of generating 4.1 Mn Tonnes of annual Green Hydrogen production.

DURATION AND PERIOD AND METHODOLOGY OF COURSE

The duration for the course will be 65 Hrs. having $1\frac{1}{2}$ Hrs. in alternative/fixed day. The timing of the lecture will be preferably in evening and alternative Saturday / Sunday. The exact day wise schedule shall be available well advance before commencement of the sessions of the program. The classes will be conducted through MST platform by link which will be provided by CBIP.

The methodology will be online lecture session / video recording.

FACULTY

Renowned / Reputed and well experienced faculty members from Renewable Power Industry / Developers / Manufacturers / Contractors / Professors from engineering colleges will be delivering the lectures.

WHO SHOULD ATTEND?

The working Professionals, Engineers / Supervisors, Engineering Graduate / Diploma Engineers who wish to enhance / update their knowledge in the field of Renewable Energy / Power sectors.

RECOGNISION / CERTIFICATION OF THE COURSE

Certificate will be issued by Central Board of irrigation & Power (CBIP) which is a reputed autonomous body in the field of Power & Water Resources having liaison with various Govt. / Semi-Govt. / Pioneer-Pvt. Sector Organizations including Central Electricity Authority, NTPC, NHPC, Powergrid, SECI etc.

CBIP institute has been recognized as Category-I training Institute by Ministry of Power, Govt. of India and also a recognized training partner of National Skill Development Corporation (NSDC), Power Sector Skill Council (PSSC) and Skill Council for Green Jobs (SCGJ)

REGISTRATION FEE

The Course Fee will be

- Rs. 19,000/- per participant
- Discounted fee for members of CBIP & SPE is Rs. 17,000/- per participant.

GST @ 18% shall be charged extra GST No. 07AAAJC0237F1ZU

Annual Membership of Society of Power Engineer (India) shall be given free of cost for one year.



TO REGISTER

The perspective participants, desirous of attending the above course may register themselves by clicking the following button:

[CLICK TO REGISTER](#)

Or by sending the following details to CBIP by email

Title of Course: _____
Name: _____
Qualification: _____
Organization /Institute(if any): _____
Mailing address: _____
E-mail: _____
Mob: _____

BANK DETAILS

Payments of registration fee should be made by cheque at par/Demand Draft drawn in favour of "Central Board of Irrigation and Power", payable at New Delhi

Or

by transfer the amount to **HDFC BANK**
SB Account No.: 00031110004411
Swift Code: HDFCINBBDEL
IFSC: HDFC0000003
MICR Code: 110240001
Address: 209-214, Kailash Building, 26 Kasturba Gandhi Marg, New Delhi -110 001

**It is compulsory that the details of the payments are shared with CBIP via mail (i.e. Jaideep@cbip.org).

ADDRESS FOR CORRESPONDENCE

A. K. Dinkar, Secretary, CBIP
Sanjeev Singh, Director, CBIP

Nodal Officers: Shri Jaideep Singh,
Sr. Manager (T)
M : 9871718218
E-mail: jaideep@cbip.org

CENTRAL BOARD OF IRRIGATION & POWER
Malcha Marg, Chanakyapuri, New Delhi - 110021
Phone: 011 26115984, E-mail: cbip@cbip.org

CBIP CENTRE OF EXCELLENCE
Plot No-21, Sector-32, Gurgaon, Haryana

PROGRAM MODULE

SOLAR POWER

- Power Sector Scenario of India including Renewable; Solar Power Technologies and Its Applications
- Overview of Solar System its Types and Components
- Load calculation Analysis
- Plant location identification- Site survey, Plant layout, Shadow analysis
- Solar geometry, Solar resources, Solar radiation
- Balance of Plants: Battery, Inverter, Charge controller, Mounting Structure, Cables, Junction Box etc.
- Components Selection Criteria and Sizing of Solar PV Systems
- Inspection, Testing & Commissioning of Solar PV System and Troubleshooting of Solar PV System
- O&M of Solar PV System and Solar PV Module Testing
- Procedures, Permissions, Approvals for Solar PV System and Preparation of DPR
- Financial Modeling and Tariff calculation of Solar PV System

WIND POWER

- Introduction to Wind Energy , Evaluation and Development
- Wind turbine technology and developments
- Various Components of Wind Turbine
- Design Criteria of Wind Turbine and Assessment of Wind resource and Its techniques
- Wind Farms- Planning & Designing
- Installation and commissioning of wind turbines
- Troubleshooting, O& M of wind farms and Testing & Certification of wind turbines
- Introduction of Small wind turbine and hybrid systems and Financial Modeling



ENERGY STORAGE SYSTEM

- Introduction to energy storage system concepts including ESS applications
- Types of electrical energy storage and key characteristics and terminology
- Parameter, Role and Various Applications of Energy Storage System
- Introduction to battery energy storage systems (including Lead Acid, Lithium Ion, Ni-Cd Batteries)
- Introduction to Power-to-gas Technology: Hydrogen Cell
- Roles of storage in the electricity grid and Integration of energy storage into electrical grids
- Grid Level Battery Storage
- Pumped Storage
- Introduction to E- Mobility
- Case Study
- Business Models for deploying Energy Storage

OTHER MODULES

- New Initiatives in Renewable Energy -
- Renewable Energy Govt. Incentives / policy, regulatory aspect / affairs
- Introduction of Substation Equipment's and Grid Integration
- Introduction to SCADA
- Introduction to Smart Grid and Smart Metering
- Introduction to Power Trading
- Introduction to Power Scheduling - Load Dispatch
- Introduction to Financing of Projects
- Introduction to Inventory Management
- Introduction to Tendering & Contract

ABOUT CBIP

Central Board of Irrigation & Power (CBIP) a premier Institution, setup by GOI in 1927 is serving the nation in the disciplines of Power, Renewable Energy and Water Resources Sectors for more than 95 years.

It is an exchange and knowledge bank for dissemination of technical knowledge & professional experience to help Engineers/ Professionals to update their knowledge and gain practical know-how.

CBIP'S MAIN OBJECTIVE IS

- To disseminate technical knowledge through various modes, e.g., publication of technical documents, organizing conferences /workshops.
- To provide specialized training to the professionals in the Power, Renewable Energy and Water Resources Sectors.

STRENGTHS OF CBIP

- A 95 years old establishment into dissemination of knowledge in Power, Irrigation and Renewable sectors.
- Almost all reputed utilities of Power, Irrigation and Renewable sectors of the country are the institutional members and at least 3000 senior officers of the level of Chief engineer and above from these sectors are the members.
- Easy availability and access to the reputed and highly experienced faculty because of above two facts.
- Has a strong base of the very senior officers with deep experience of various disciplines of Power and irrigation sector.
- Has the secretariat of at least 10 international organizations and the Secretary CBIP is the secretary or the member secretary of their India chapters.



ABOUT SOCIETY OF POWER ENGINEERS (SPE INDIA)

The Society of Power Engineers (India) is an apex body engaged in the activities of technological upliftment of the power engineers of this country by making available latest technological developments all over the world to the members. Publication & distribution of information Journal, Workshops/Seminar, group discussion are regular features of the society.

The aims and objects for which the Society is constitute to promote the advancement of power engineering and allied subjects, and their applications, and to provide facilities for the exchange of information and ideas on those subjects amongst the members of the Society and for that purpose

WHO CAN BECOME MEMBER OF SOCIETY OF POWER ENGINEERS (INDIA)

- Any students' studying for Diploma in Engineering or Degree in Engineering in any Discipline having inclination to work on Power Sector.
- Any Diploma or Degree holder in any discipline having power engineering related interest.
- Any Institute which is engaged in the power engineering business or is interested in Development of power Sector.

MEMBERSHIP GRADE

- Student
- Associate Member
- Member
- Life Member
- Fellow Member
- Institution Member

MEMBERSHIP FEE

For Student Member: Rs.500/- (including Admission Fee and annual Subscription Fee and Local Fee).

For Associate Member: Rs.700/- (including Admission Fee and annual Subscription Fee and Local Fee)

THE BENEFITS AND OPPORTUNITIES OF SPE INDIA MEMBERS ARE OUTLINED BELOW

- Members will have access of half yearly periodic Journal contains latest articles by the experts
- Members will have preference to publication of article in the Society Journal
- Members can have free online access of SPE INDIA and CBIP's international Societies technical papers / presentations and publications.
- Free online access to Telephone Directory of Key Personnel in Power, Renewable and Water resources sectors being published by CBIP
- Regular intimation about the activities and events being organized by Society and its chapters from time to time.
- 10% discount maximum up to Rs. 500/- in the participation fee for the events being organized from time to time by the Society.
- 10% concession for publishing advertisement in the periodical/Journal of the Society.
- Inclusion of one page write-up about the Organization in Journal for Institutional Members.
- Network and opportunity to interact with industry leaders and corporate officials during various events being organized by Society, which will help the student members for making their career in power sector.
- Members will receive "Certificate of Membership"
- Student Members will have opportunity to participate in online quiz being organized by Society free of cost
- Save Rs.2500 to Rs.5000 per annum while attending various events organized by SPEINDIA time to time.

****For More Details and to Become a Member of SPE India [Please Click](#)****