



EDSMAT
Energy Development: Services,
Management and Technology
Yunus Center AIT

Sustainable Energy Transition
Academic Program
Department of Energy,
Environment and Climate Change



GOVERNMENT OF INDIA
MINISTRY OF POWER



WePOWER SAR-100 Training Series: Delhi Event (15-16, February 2024)

100 Mid-career women professionals from the South Asian Region (SAR)

Regional Working Group (RWG):
National Power Training Institute



Sponsored By:



ग्रिड-इंडिया
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About the Program

WePOWER is a partnership of around 38 South Asian energy organizations who support women's participation in energy projects and institutions and promotes normative change regarding women in Science, Technology, Engineering, and Mathematics (STEM) education.

WePOWER SAR100 is a series of trainings for one hundred women professionals in the energy sector from the Southeast Asia region (SAR).

The World Bank is spearheading SAR100 together with national counterparts from seven (7) participating countries represented in the Regional Working Group (RWG).

100 mid-career women professionals from the South Asian Region (SAR), namely Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka are participating in this training series. Including 32 women participants from India.

National Power Training Institute (NPTI) is a part of the RWG and is serving as a national focal point for India.

A Certificate of Completion will be provided to the trainees who successfully complete the rigorous coursework, practical assignments and assessments at the end of the training program.

Agenda/Objectives of the Program

To create a gender-diverse pool of experts for planning, developing and operating regionally integrated grid, regional power systems and power markets.

It aims to upgrade skillsets required for the transitioning South Asian Power Sector.

The training series is designed to equip the women participants for leadership roles.

The training series also provides technical training and networking opportunities to women engineers and empowers them for senior management roles.

Soft skill topics like addressing Gender and Unconscious Bias and Everyday Leadership is also covered in the training program.

Need of such Programs

Upgrading skill-sets and building gender diversity in power sector.

Promotes diversity and inclusion within an industry traditionally dominated by men, fostering a work environment enriched with diverse perspectives, ideas, and problem-solving approaches.

Helps to address the skills shortage prevalent in the power sector, tapping into the untapped female talent pool to bring a broader range of skills and expertise.

Training women in this sector provides economic empowerment, offering valuable job opportunities and improving their financial independence and overall well-being.

India has a huge potential to benefit from these standardized training and capacity building programs for women from the beginning of their career in Power Sector.

For the transition to sustainable energy systems, Indian Power Sector must attract and retain skilled and qualified women professionals.

Participants from India

Sl.No.	Name	Designation	Organisation
1	Amrita Sarangi	AGM (Electrical)	GRIDCO
2	Amrita Tiwari	Assistant Engineer (Generation)	M.P. Power Generating Co. Ltd.
3	Annapurna S.H	Assistant Engineer (Electrical)	Energy Department Karnataka
4	Anuradha Singh	DGM (Operation Excellence Team)	BSES Rajdhani Power Ltd.
5	Archana Sahoo	DGM, Dy. Director (Tariff)	Odisha Electricity Regulatory Commission
6	Bhawana Choudhary	Deputy Director	NPTI
7	Chintan Sher	Executive Engineer	Haryana Vidyut Prasaran Nigam Ltd
8	Deepshikha Joshi	DGM (O&M)	NTPC
9	Foram B. Thaker	Dy. Engineer	GETCO
10	Harapriya Behera	Deputy Manager	Odisha SLDC
11	Jeena Borana	Dy. General Manager	BSES Yamuna Power Ltd.
12	Komal Dupare	Assistant Director, PSPA Division	CEA
13	Moumita Saha	Manager (E)	DVC
14	Nivedita Pramanik	Assistant General Manager (Electrical)	GRIDCO
15	Palika	Executive Engineer	Haryana Vidyut Prasaran Nigam Ltd
16	Piyali Sarkar	Deputy Director	NPTI

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Sl.No.	Name	Designation	Organisation
17	Priyadarshini Madhusmita	Deputy Manager	Odisha SLDC
18	Rashi Tyagi	DGM (Electrical)	SJVNL
19	Remya K	Manager-AC S/S MAINT	POWERGRID
20	Riddhi Prasad	Senior Manager (Elect.)	DVC
21	Roshni Abraham Alex	General Manager	PFC
22	Sakshi Jindal	Manager Technical	EESL
23	Shipra Kharwal	Senior Manager (Electrical)	NHPC Limited
24	Shweta Kujur	Executive Engineer, Deptt. Of Energy	Govt. of Chhattisgarh
25	Siuli Goswami	Addl. Chief Engineer	WBSEDCL
26	Smita Aparajita Pattanaik	Deputy Manager	Odisha SLDC
27	Sneh Daheriya	Vice President (Operations)	PTC India
28	Sreoshi Chatterjee	Manager-Power Plant Engineer	The Durgapur Projects Ltd
29	Sugata Bhattacharya	Dy. Manager	Grid India
30	Susmita Mohanty	DGM (Electrical)	GRIDCO
31	Tarali Deka	Deputy Manager (RE)	Assam Electricity Grid Corporation Ltd.
32	Tulika Bhattacharjee	Engineering Officer Grade 3	CPRI

Training Program Outline

This training series comprised of 10 modules, delivered in online mode from July 2023.

A one-week on-campus capstone event at AIT from 4th-8th March 2024 will conclude the program.

Each module is designed to impart the equivalent of 1.5-credit hours, comprising 30 hours of cumulative learning time. Every module spans a three-week cycle.

The details of each module is presented in the subsequent slides.

Week 1:
15 hours of real-time online classes

Week 2:
15 hours of supervised onsite practical learning assignments

Week 3:
Completing assignments and down time

Modules of the Program

Regional Power
Systems &
Renewable
Energy Integration

Planning and
design of
integrated Power
Systems

Operation and
Control of
integrated Power
Systems

Maintenance &
Optimization of
Integrated Power
Systems

Power Markets &
Regulatory
Frameworks in
South Asia

Power Market
Operation and
Trading

Renewable
Energy Integration
in Power Markets

Power Market
Planning &
Governance in
South Asia

Distribution and
Distributed
Generation

Women and
Leadership

Module 1- Regional Power Systems & Renewable Energy Integration

TOPICS

- Introduction to Regional Systems and their benefits
- Key issues and players in the Regional Power Sector and their rules
- A brief introduction to current Clean Energy technology and their suitability for the South Asian Region
- Regional Power Market and Renewable Energy Integration
- Principles of Power Systems planning and design
- Planning for Sustainable Development
- Regulatory Framework principles for Power Sector planning
- Smart Grid Technology for RE integration
- Financing and investment for RE projects tariff setting options for RE projects
- Risk management & mitigation for RE projects
- Case studies of successful regional integration
- Environmental & social safeguards for RE projects

SUBJECT MATTER EXPERTS

- Prof. P. Mancarella, Professor and Chair of Electrical Power Systems, Melbourne Energy Institute, University of Melbourne, Australia
- Dr. Sushil K. Soonee, Founding and former CEO and Advisor, POSOCO, India
- Prof. P. Abdul Salam, Professor and Dean, School of Environment, Resources, and Development, AIT, Thailand
- Dr. Jai Govind Singh, Associate Professor, Sustainable Energy Transition, Department of Energy, AIT, Thailand
- Dr. Abhishek Ranjan, Vice President and Head of Renewable, Smart and DSM Projects, BRPL, India
- Prof. Tripta Thakur, Director General, National Power Training Institute (NPTI), Ministry of Power, Government of India
- Dr. Tanatat Puttasuwan, International Consultant on Finance and Investment, AIT Extension
- Dr. Priyanka Paliwal, Assistant Professor, Electrical Engineering Department, MANIT, Bhopal
- Mr. Manu Shrivastava, Principal Secretary, Technical Education, Skill Development and Employment Department & Rural Industries Department, Government of Madhya Pradesh

Module 2- Planning and Design of Integrated Power Systems

TOPICS

- Fundamentals of PS Planning and Design
- Planning for Sustainable Development
- Regulatory Framework for PS Planning
- RE Resource Assessment
- Mapping RE Grid Integration Studies
- Transmission and Distribution Planning
- Load Forecasting and Network Planning
- Transmission and Distribution Asset Management
- Energy Storage Technologies and applications
- Microgrid Planning and Design
- Risk Assessment and Management
- Emergency Response and Restoration

SUBJECT MATTER EXPERTS

- Prof. S. N. Singh, Director, ABV-IIITM Gwalior and Professor, IIT Kanpur, India
- Dr. Sanjoy Kumar Parida, Associate Professor, IIT Patna, India
- Shanti K. Swarup, Professor, IIT Madras, India
- Prof. Trapti Jain, Professor, IIT Indore, India
- Dr. Ranjana Sodhi, Assistant Professor, IIT Ropar, India
- Prof. Tripta Thakur, Director General, National Power Training Institute (NPTI), Ministry of Power, Government of India
- Dr. Gururaj Mirle Vishwanath, Assistant Professor, IIT Kanpur, India

Module 3- Operation and Control Of Integrated Power Systems

TOPICS

- Fundamentals of operation & control
- Power System dispatch & scheduling
- Energy Management System
- Fundamentals, Voltage & Reactive power regulation
- Power Factor correction & compensation
- Frequency Control & load shedding
- Ancillary services & Grid Code
- Integration of DERs in Power System
- DER control & management strategies
- Power System stability & security
- Power System protection & fault analysis

SUBJECT MATTER EXPERTS

- Prof. Abdul Hasib Chowdhury, Professor, Bangladesh University of Engineering and Technology
- Prof. Anurag Srivastava, Raymond J. Lane Professor and Chairperson, West Virginia University, Morgantown
- Prof. Francisco Gonzalez-Longatt, Professor, University of South-Eastern Norway
- Prof. Ramesh Bansal, Professor, University of Sharjah
- Dr. Gururaj Mirle Vishwanath, Assistant Professor, IIT Kanpur, India
- Dr. Abheejeet Mohapatra, Associate Professor, IIT, Kanpur

Module 4- Maintenance & Optimization of Integrated Power Systems

TOPICS

- Fundamentals of PS Planning and Design
- Planning for Sustainable Development
- Regulatory Framework for PS Planning
- RE Resource Assessment, Mapping RE Grid Integration Studies
- Transmission and Distribution Planning
- Load Forecasting and Network Planning
- Transmission and Distribution Asset Management
- Energy Storage Technologies and applications
- Microgrid Planning and Design
- Risk Assessment and Management
- Emergency Response and Restoration
- Power system dispatch & energy management, Voltage & reactive power control, Distributed Energy Resources (DER) integration and control

SUBJECT MATTER EXPERTS

- Rajesh Gupta, Professor, MNIT Allahabad, India
- Tauseef Hassan Farooqi, Former Chairman, NEPA, Pakistan
- Dr. Gururaj Mirle Vishwanath, Assistant Professor, IIT Kanpur, India
- Dr. Jai Govind Singh, Associate Professor, Sustainable Energy Transition, Department of Energy, AIT, Thailand
- Francisco Gonzales-Longatt, Professor, University of South-Eastern Norway
- Dr. Vivek Mohan, Assistant Professor, National Institute of Technology Calicut, India

Module 5- Power Markets & Regulatory Frameworks in Asia

TOPICS

- Overview of Power Sector in South Asia, Role of regulatory bodies in the Power Sector
- Regulatory framework and harmonization of policies, Introduction to South Asian Regional Power Markets
- Market operation, clearing and settlement; Trading & contracting in Power Markets, Market-based dispatch and scheduling
- Ancillary services in Power Markets
- Capacity markets & their role in South Asian regional power system; Capacity payment mechanism & incentives
- Market design consideration for scaling up RE in South Asian power market
- Overview of PPAs for RE projects; PPA negotiation and contracting process
- Cross-Border Power Trading & interconnections
- Power market planning and governance
- Best practices and case studies for power markets and RE development in South Asian Region

SUBJECT MATTER EXPERTS

- Prof. Deepak Sharma, Professor, Sustainable Energy Transition, AIT, Thailand
- Dr. Prabodh Bajpai, Associate Professor, Department of Sustainable Energy Engineering, IIT Kanpur
- Dr. Debabrata Chattopadhyay, Senior Energy Specialist, World Bank
- Dr. Abhishek Ranjan, Senior VP Strategy, Renew Power
- Mr. Sushil Kumar Soonee, Founding and former CEO and Advisor, POSOCO, India
- Dr. Sushanta Chatterjee, Chief (Regulatory Affairs), CERC, India
- Ravi Anand, VP, B.Grimm Power
- Jitender Madan, Professor, IIT Delhi
- Mrutyunjaya Nanda, Project Manager, Asia Clean Energy Partners

Module 6- Power Market Operation and Trading

TOPICS

- Introduction to power markets and trading : a. Overview and key market participants and their roles, b. Market design and regulatory framework
- Market operation and pricing mechanism : a. Market clearing and settlement mechanism, b. Locational Marginal Pricing (LMP) and nodal pricing, c. Ancillary services and their pricing
- Trading strategies and risk management : a. Trading strategies and their application in power markets, b. Risk management and hedging techniques, c. Financial instruments and their valuation
- Market monitoring and performance assessment
- Market design and pricing mechanism for RE and DERs
- Cross-border trading and market integration : a. Market integration and coordination across various countries, b. Challenges and opportunities for regional market integration
- Best practices and case studies

SUBJECT MATTER EXPERTS

- Dr. Mithulan Nadarajah, Director of Higher Degree Research & Professor, University of Queensland
- Mr. Harish Saran, ED, PTC India Ltd.
- Dr. Tripta Thakur, Director General, National Power Training Institute (NPTI), Ministry of Power, Government of India
- Mr. Soonee Sushil Kumar, Founding and former CEO and Advisor, POSOCO, India
- Dr. S. N. Singh, Director, ABV-IIITM Gwalior and Professor, IIT Kanpur, India
- Mr. Ashutosh Sharma, Assistant Chief of Economics & Power Market, CERC, India
- Mr. Waleed Saleh Alsuraih, Lead Energy Specialist, World Bank
- Ms. Swathi Battula, Assistant Professor, Department of Electrical Engineering, IIT Kanpur
- Dr. Jai Govind Singh, Associate Professor, Sustainable Energy Transition, Department of Energy, AIT, Thailand

Module 7- Renewable Energy Integration in Power Markets

TOPICS

- Overview of RE integration in SA region
- Key technical and economic considerations for RE integration
- Market design and regulatory framework for RE integration
- RE technologies and generation characteristics, RE forecasting techniques and their accuracy, Scheduling and dispatch of RE generation
- Impact of RE integration on power system operation and stability
- RECs and their market mechanism, Net metering and DER market mechanism
- Modelling energy systems transitions
- AI and Machine Learning basics, trends and its application, ML in solar PV operation and maintenance
- Application of ES for RE integration, Market design and pricing mechanism for energy storage
- Market integration and coordination of RE across different countries

SUBJECT MATTER EXPERTS

- Prof. Asheesh Kumar Singh, Professor, MNIT, India
- Dr. Rupendra K. Pachauri, Associate Professor, School of Advanced Engineering, UPES, Dehradun, India
- Prof. Bharat Singh Rajpurohit, Professor, Department of Electrical Engineering, IIT Jodhpur, India
- Dr. Omkar Patange, Research Scholar, International Institute for Applied Systems Analysis
- Prof. Dilip Kumar Sharma
- Dr. M.S. Hossain Lipu, Associate Professor and Director, Green University of Bangladesh
- Mr. Shubham Tiwari, Researcher, International Institute for Applied Systems Analysis
- Mr. Bikram Singh, VP, PTC India Ltd.
- Mr. Bharat Sharma, AVP, PTC India Ltd.

Module 8- Power Market Planning and Governance in South Asia

TOPICS

- Market performance indicators and benchmarks
- Market surveillance and compliance monitoring
- Resource adequacy and capacity markets
- Market mechanism for promoting RE and DG
- Integration challenges and solutions
- Power system reliability
- RE case studies in the Middle East
- Investment signals and market incentives for new generation and transmission
- Market structures, policies and regulatory framework
- Role of government agencies
- Regulators and industry stakeholders

SUBJECT MATTER EXPERTS

- Dr. Tsikalakis Antonis, Assistant Professor, Electrical and Computer Engineering Department, Hellenic Mediterranean University, Greece
- Dr. Jai Govind Singh
- Dr. Venkatachalam Anbumozhi, Director of Research Strategy and Innovation, Economic Research Institute for ASEAN and East Asia
- Prof. Vava Raj Karki, Professor, Department of Electrical Engineering, IOE Pulchowk Campus, Nepal
- Dr. Sasidharan Sreedharan, Assistant Professor, School of Engineering, University of Technology and Applied Sciences, Sultanate of Oman
- Md Aktarujjaman, Engineering Manager, Akaysha Energy, Melbourne, Australia
- Kazi Nazmul Hasan, Senior Lecturer, Electrical Engineering (Power & Energy Systems), RMIT University, Melbourne, Australia

Module 9- Distribution and Distributed Generation

TOPICS

- Distribution planning, software etc.
- Design and implementation of an efficient distribution system
- Poles, structures, insulators, LA fuse conductors, bunched cables etc.
- Protection, metering
- DMS SCADA IED, power quality
- Testing, installation, and commissioning
- Recent technologies in distribution
- Earthing, safety, rules regulations
- Tariff design and financial aspects
- IBR, DR, DMS, DER, DPMU, DLM
- Integration of solar rooftops, batteries, and DERs in general
- Distribution automation, Distribution systems resilience
- Demand side management/demand response
- Case studies

SUBJECT MATTER EXPERTS

- Mr. Soumyadeep Ray, Divisional Engineer (Electrical), West Bengal State Electricity Authority, India
- Mr. Saptarshi Das, Intermediate Electrical Design Engineer, Reach Active Ltd, UK
- Mr. Cheten Tshering, Senior Manager, Smart Grid Section, BPC, Bhutan
- Prof. Mini S. Thomas, Professor, Department of Electrical Engineering, JMI, India
- Dr. Dinesh Rangana Gurusinghe, Manager, RTDS Technologies Inc., Canada
- Dr. Prabhakar Tiwari
- Prof. Rajeev Kumar Singh, Professor, Department of Electrical Engineering, IIT BHU, India
- Dr. Praveen Tripathy, Associate Professor, Department of EEE, IIT Guwahati, India

Module 10- Women and Leadership

TOPICS

- Understanding Gender
- Women and Governance
- Women and Corporate Leadership
- Personal and Professional Roles
- Success Stories and Experience Sharing
- Interactive Session with Role Models

SUBJECT MATTER EXPERTS

- Mr. Bindu Lohani, Former VP, ADB
- Dr. Paula Banerjee, Professor, AIT, Thailand
- Prof. Faiz Shah, Professor, AIT, Thailand
- Dr. Joyee S. Chatterjee, Associate Professor, AIT, Thailand
- Dr. Gargi Chatterjee, ED, CESC, India

Event in Delhi: 15-16 February, 2024

Being the member of Regional Working Group (RWG) from India, NPTI has organized this two days event in Delhi from 15-16 February 2024 as a part of this training program.

The purpose of this event in Delhi is to give the participants an opportunity to collaborate and foster an inter organizational networking for better coordination in relevant projects and sector.

Interaction with the top leadership of Indian Power Sector will motivate these professionals to also assume leadership roles in their respective departments and organizations.

Interaction with the CMD's of CPSU's under this Ministry will give them a sense of exposure on how organizations on this large scale functions.

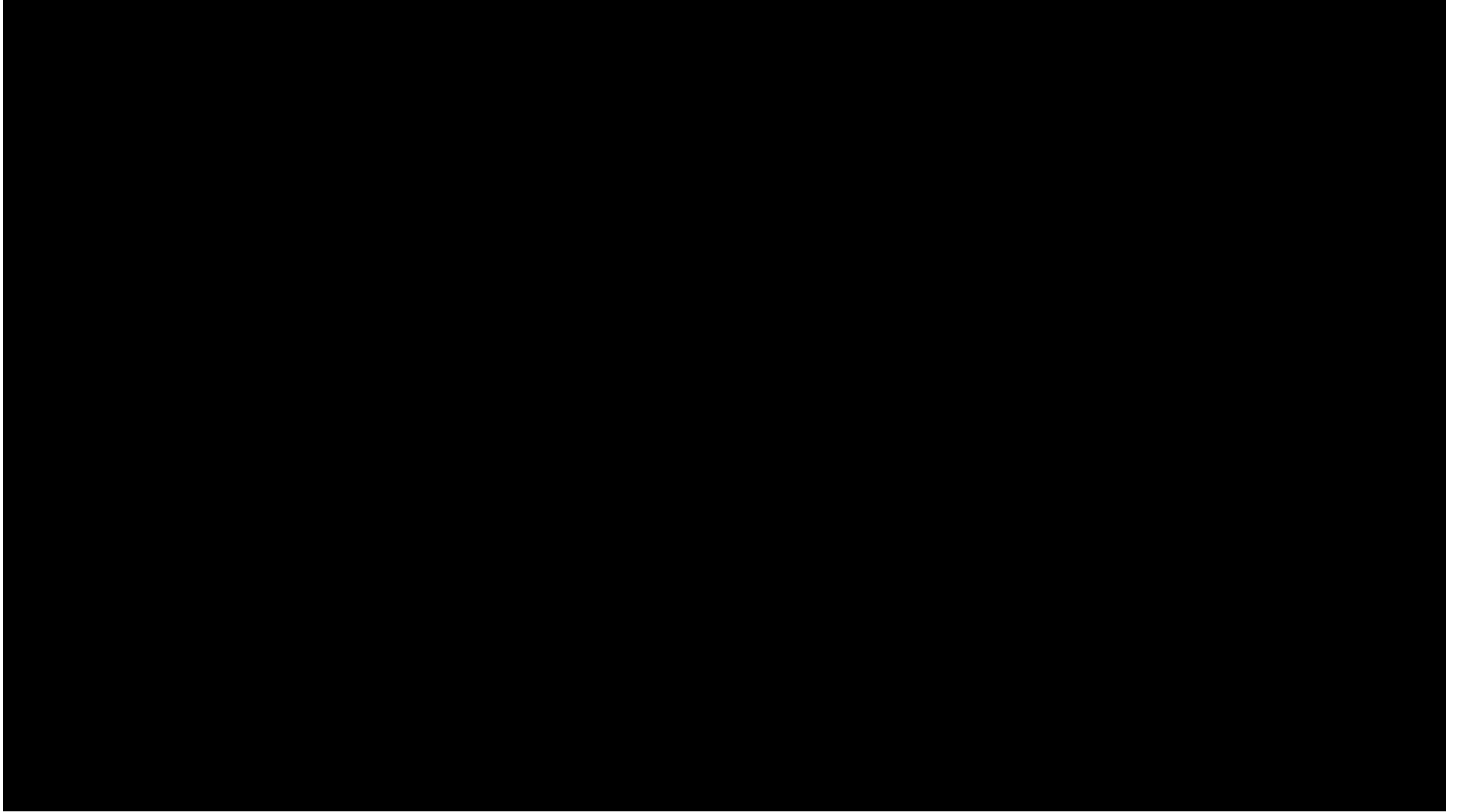
In this event participants will also be given exposure to latest facilities and technologies employed in power sector with technical visits

The participants will visit:

- 800MW Thermal Power Plant & CCGT Simulator in NPTI Faridabad
- National Institute of Solar Energy (NISE), Gurugram
- National Load Dispatch Centre, New Delhi



Two Days Pilot Training Program to the Diploma/ ITI participants for Rooftop Solar installations (Basics of RTS Components, Inspection, Installation & Commissioning, Testing and Maintenance) Under the Pradhan Mantri Suryoday Yojana Organized by NPTI in co-ordination with REC at Varanasi, Uttar Pradesh (29.01.2024-30.01.2024)





NPTI organized Capacity Building Program on “Energy Conservation” and "Formation of Energy Club & Energy Survey” in 380 selected Kasturba Gandhi Balika Vidyalaya (Residential Girls schools) of Uttar Pradesh for the first phase





NPTI organized Capacity Building Program on “Energy Conservation” and "Formation of Energy Club & Energy Survey” in 365 selected Kasturba Gandhi Balika Vidyalaya (Residential Girls schools) of Uttar Pradesh for the second phase



THANK YOU

