South Asia Forum for Infrastructure Regulation (SAFIR) Core Course

Infrastructure Regulation: Markets, Green Energy Transition and Regulatory Governance

6 – 9 February, 2026

IIT Kanpur Outreach Centre, Noida

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Organised by

Centre for Energy Regulation (CER)
Department of Management Sciences
Indian Institute of Technology Kanpur

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Program Agenda

Day 1 – Friday, 6th February, 2026	
0900 – 0930 Hrs.	**Inaugural Function:** Chief Guest: Mr. Harpreet Singh Pruthi, Secretary, Central Electricity Regulatory Commission
0930 – 1100 Hrs.	**Overview of Power Market: India and Global Perspective** Dr. Sushanta K. Chatterjee, Chief (Regulatory Affairs), Central Electricity Regulatory Commission
1100 – 1130 Hrs.	Tea / Coffee Break
1130 – 1300 Hrs.	**Regulation of Oil & Gas Infrastructure:** Dr. Anil Kumar Jain, Chairperson, Petroleum and Natural Gas Regulatory Board
1300 – 1400 Hrs.	Lunch Break
1400 – 1530 Hrs.	**Energy Transition: Challenges to Grid Operation** Mr. S. R. Narasimhan, Former CMD, Grid Controller of India Limited
1530 – 1600 Hrs.	Tea / Coffee Break
1600 – 1730 Hrs.	**Regulatory Brainstorming Session I – Experience Sharing**
2000 – 2200 Hrs.	Gala Dinner
Day 2 – Saturday, 7th February, 2026	
0930 – 1100 Hrs.	**Regulatory Governance Framework in Infrastructure Sector in South Asia** Dr. Anoop Singh, Professor, IIT Kanpur
1100 – 1130 Hrs.	Tea / Coffee Break
1130 – 1300 Hrs.	**Infrastructure to Support Clean Energy Transition: EV Charging,** Mr. D.K Srivastava, Chief Engineer, Ministry of Power
1300 – 1400 Hrs.	Lunch Break
1400 – 1530 Hrs.	**Regulatory Process and Dispute Resolution,** Mr. Sanjay Sen, Senior Advocate, Supreme Court of India
1530 – 1600 Hrs.	Tea / Coffee Break
1600 – 1730 Hrs.	**Regulatory Brainstorming Session II – Emerging Challenges**
Day 3 – Sunday, 8th February, 2026	
0930 – 1100 Hrs.	**Regulation of Cross-Border Energy Trade and Regional Power Market** Mr. Ghanshyam Prasad, Chairperson, Central Electricity Authority
1100 – 1130 Hrs.	Tea / Coffee Break
1130 – 1300 Hrs.	**Experiences from Regulation of Telecom and Digital Payment Infrastructure,** Dr. M.P Tangirala, Member, Telecom Regulatory Authority of India
1300 – 1400 Hrs.	Lunch Break
1400 – 1530 Hrs.	**Regulatory Framework and Prospects for Transport (Ports & Railways)** Dr. G. Raghuram, Former Director, IIM Bangalore
1530 – 1600 Hrs.	**High Tea / Coffee Break**
1600 – 1700 Hrs.	**Valedictory Function:** Chief Guest: Mr. Jishnu Barua, Chairperson, Central Electricity Regulatory Commission
2000 – 2200 Hrs.	Special Dinner
Day 4 – Monday, 9th February, 2026	
0930 – 1030 Hrs.	Travel to NPCL
1030 – 1230 Hrs.	**Noida Power Company Limited, NPCL** (Site Visit)
1230 – 1400 Hrs.	Lunch Break
1400 – 1530 Hrs.	Travel to GRID-INDIA
1530 – 1700 Hrs.	**Grid Controller of India Limited (GRID-INDIA)** (Site Visit)
1700 – 1800 Hrs.	Return to Noida IIT Kanpur Outreach Centre

Chief Guests

Mr. Harpreet Singh Pruthi
Secretary, CERC
Inaugural Session

Mr. Jishnu Barua
Chairperson, CERC
Valedictory Session

Speakers

Dr. G. Raghuram
Former Director
IIM Bangalore

Dr. S. K. Chatterjee
Chief (Regulatory Affairs)
CERC

Mr. S. R. Narasimhan
Former CMD
GRID-INDIA

Dr. Anil Kumar Jain
Chairperson, PNGRB
PNGRB

Mr. Ghanshyam Prasad
Chairperson
CEA

Dr. M. P. Tangirala
Member
TRAI

Mr. D. K. Srivastava
Chief Engineer
MoP

Mr. Sanjay Sen
Senior Advocate
Supreme Court

Dr. Anoop Singh
Professor
IIT Kanpur

Participants

Mr. Sandeep Neupane
ERC, Kathmandu, Nepal

Ms. Surekha Saranga Wijesinghe
PUCSL, Sri Lanka

Mr. Surobin Roy
CSERC, Raipur

Mr. Shrey Verma
CSERC, Raipur

Mr. Ishan Halder
IEX Ltd.

Mr. Ankit Kumar
IEX Ltd.

Ms. Anandita Debnath
TERC

Mr. Ajay Kumar Chadha
HPERC

Ms. Deepanshi Jaiswal
PTC India

Mr. Aditya Prasad Das
GRID-INDIA

Mr. Partha Sen
AERA

Mr. Soham De
ONGC Tripura Power Co. Ltd.

Mr. Aditya Tomar
HPX Ltd.

Mr. Rajat
JERC for the State of Goa & UTs

Mr. Jibu George
PXIL

Mr. Ashish Chander Sharma
NTPC Ltd.

Mr. Jitendra Malhotra
NTPC Ltd.

Mr. Chandra Prakash Barala
FSR Global

Mr. A.B. Narsing Raj
TSERC

Mr. Arakesh Madhu M.L.
KERC

Mr. P.V. Vinod Shenoy
NHPC Ltd.

Mr. Sherub Gyeltshen
ERA, Bhutan

Mr. A.U. Adhwaryu
GERC

Mr. Kushalkumar L. Bhosikar
DERC

Mr. Monojit Sehrawat
CERC

Mr. Manmohan Shukla
CERC

Mr. Manoj Verma
CERC

Mr. Bishal Shrestha
ERC, Kathmandu, Nepal

Mr. Bikas Dangol
ERC, Kathmandu, Nepal

Mr. Yogesh Kinkar
MPERC

Mr. Sanjeev Kumar Mahato
JERC

Mr. Sachin Bayas
MERC

Mr. Sahil Kumar
IICA

Inaugural Function

Chief Guest

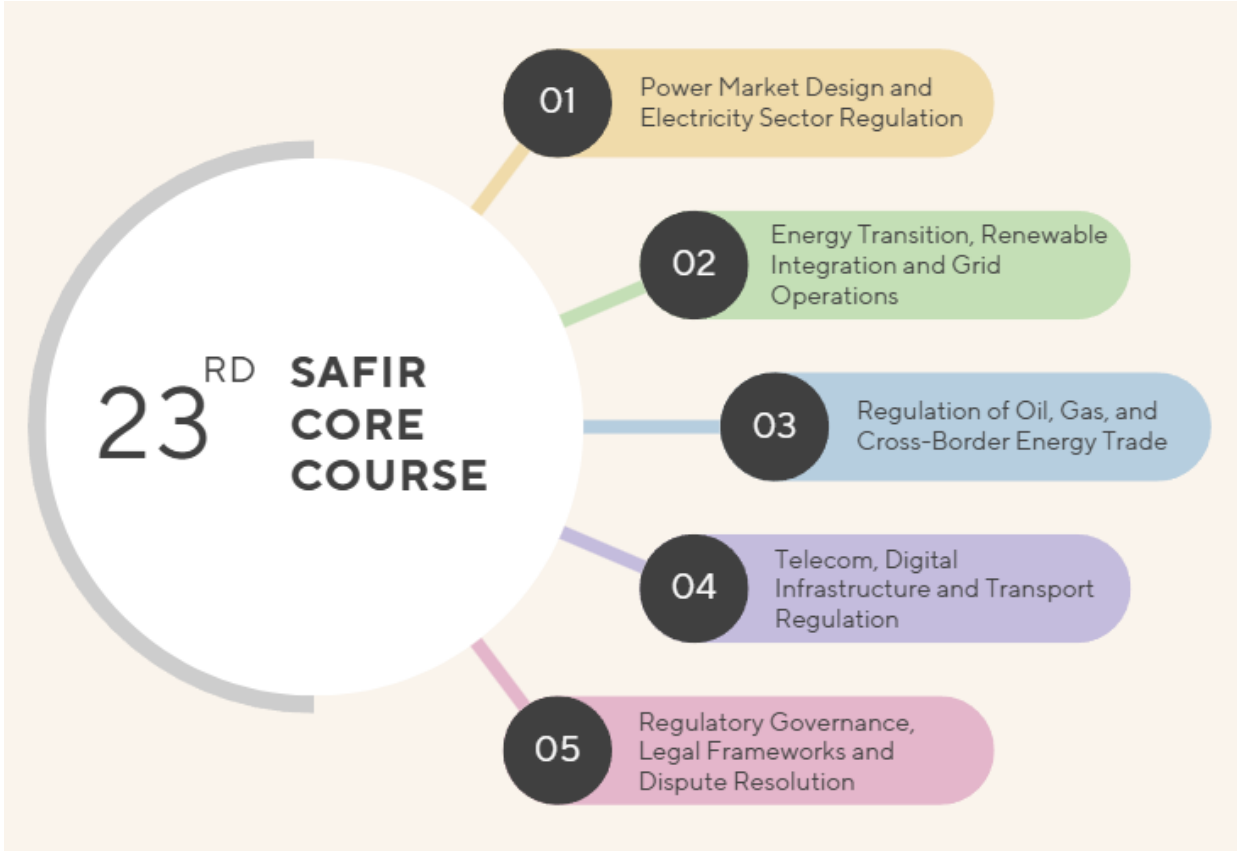
Mr. Harpreet Singh Pruthi

Designation: Secretary

Organisation: Central Electricity Regulatory Commission (CERC)

Educational Profile and Experience: Mr. Harpreet Singh Pruthi is the Secretary of the Central Electricity Regulatory Commission (CERC) and a senior civil servant of the Indian Railway Stores Service (IRSS), 1998 batch, with more than 22 years of distinguished experience in the energy sector and Indian Railways. He has played a pivotal role in India's electricity policy, regulatory frameworks, and infrastructure reforms, with expertise spanning electricity markets, transmission policy, public procurement, public–private partnerships, and institutional capacity building. His contributions have significantly advanced transparency, efficiency, and sustainability in the power sector. He has led major regulatory initiatives including the CERC Tariff Regulations 2024, Grid Code 2023, General Network Access (GNA), and Ancillary Services Regulations, promoting open access, renewable energy integration, and efficient grid operations. He has also driven market development through the introduction of electricity derivatives in coordination with SEBI and Virtual Power Purchase Agreements (VPPAs) to enhance market flexibility and renewable energy contracting for industries. Mr. Pruthi has strengthened institutional capacity and research through partnerships with IIT Delhi, IIT Roorkee, and IIT Kanpur to establish Centres of Excellence for regulatory studies and evidence-based policymaking. His policy leadership includes contributions to national initiatives such as the 500 GW renewable energy target by 2030, EV charging infrastructure policy, and third-party coal sampling, delivering significant efficiency and consumer benefits. In the Indian Railways, as Executive Director in the Ministry of Railways, he oversaw India's largest-ever wagon procurement programme and implemented e-reverse auctions, achieving substantial cost savings. Academically, he holds an MBA in Public Management and Policy from IIM Ahmedabad, an M.S. (Research) in Mechanical Engineering from IIT Delhi, and a B.E. in Mechanical Engineering from Punjab Engineering College, Chandigarh. He has represented India at international forums including the UNFCCC COP 23 negotiations in Bonn and under the Indo-German Energy Forum for renewable energy integration. His achievements have been recognised through awards such as the Minister of Railways Award, multiple Efficiency Shields for Best Material Management, and the General Manager's Award. He has also undergone advanced training and global exposure through programmes at INSEAD, ICLIF Malaysia, IIM Ahmedabad, and the University of Geneva, and continues to contribute actively to strengthening India's power sector and regulatory institutions.

Glimpses from the Session



Day-1

Session 1: Infrastructure Regulation: Markets, Green Energy Transition and Regulatory Governance

Speaker

Dr. Sushanta Kumar Chatterjee

Designation: Chief (Regulatory Affairs)

Organisation: Central Electricity Regulatory Commission

Educational Profile and Experience: Presently Chief (Regulatory Affairs) with Central Electricity Regulatory Commission (CERC), Dr. Chatterjee has long experience of dealing with power sector reforms, especially, Regulatory Reforms since its inception in 1998.

He is a Fulbright Scholar and has been a post-doctoral research fellow at Harvard Kennedy School, USA. He holds a Ph.D. in Management, an MBA in Finance, and a master's degree in economics.

He has co-authored "The Electricity Sector in India: Policy and Regulation" (Oxford University Press, 2012); authored "S.K. Chatterjee's Commentary on the Electricity Laws of India" (Delhi Law House, 2006); published papers on renewable (World Bank 2013; NREL 2016; Energy Policy 2021; The Science 2022; The Electricity Journal 2023); completed research as Principal Investigator (Topic: "Meeting the Renewable Revolution: A Roadmap for Electricity Market Design in India") at International Growth Centre, London School of Economics, UK (2017); co-authored "Renewable Energy in India: Economics and Market Dynamics" (Sage Publishing, India, 2021).

Public policy has been his passion in both professional and academic life. He has demonstrated a leadership role in conceiving, designing, and implementing policy and regulation, especially on renewable and electricity market design in India. He has played a pioneering role in introducing the Electricity Act, 2003; Renewable Energy Certificate mechanism; Security Constrained Economic Dispatch; Real Time Market; market-based Ancillary Services.

He has been a member of, and continues to serve on, several Committees constituted by the Ministry of Power, CERC, Forum of Regulators, and South Asia Forum for Infrastructure Regulation. He regularly serves as a guest faculty at several institutions in India and abroad. Dr. Chatterjee has been nominated as the first President of the Indian Association of Energy.

Session Highlights

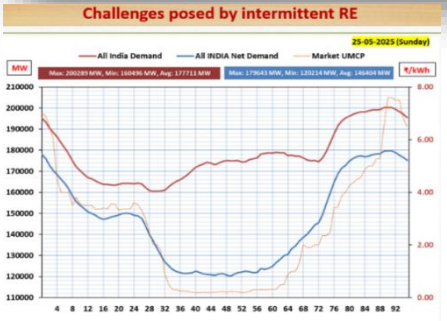
Dr. Sushanta Kumar Chatterjee discussed the evolving contours of future electricity markets, emphasizing the importance of grid stability and resource adequacy in the context of increasing integration of intermittent renewable energy. He highlighted the role of flexible demand-side resources, optimized transmission planning, and efficient market mechanisms in supporting reliable system operations. The discussion also covered how innovative financial products and decentralized dispatch mechanisms can streamline market operations while ensuring the financial viability of distribution utilities through improved performance and retail competition.

The session further included an interactive discussion with participants on the following key topics:

- **Market Design Contours**
- **Comparison of Different Markets**
- **Market Design: India Case Study**
- **Challenges Due to Intermittent RE**

Handling power system operation challenges with greater penetration of intermittent RE
- problem of ever dipping belly of the duck curve
- focus on resource adequacy
  - to ensure procurement of right resource mix and consequently
  - to avoid under-utilisation of resources as at present
- contracting structure – a rethink –
  - separate contracting for peak load and
  - contracting for flexible resources for managing ramping requirements.

Glimpses from the Session



Session 2: Regulation of Oil & Gas Infrastructure

Speaker

Dr. Anil Kumar Jain

Designation: Chairperson

Organisation: Petroleum and Natural Gas Regulatory Board (PNGRB)

Educational Profile and Experience: Dr. Anil Kumar Jain is a former member of the Indian Administrative Service of the 1986 Batch. He has more than two decades long administrative experience in energy and environment. He has served as Secretary in the Ministry of Coal and Ministry of Mines where he led reforms in sustainable mining and market development. In his earlier stint as Special Secretary in Ministry of Environment, Forest and Climate Change, Dr. Jain looked after the work relating to environmental clearances, bio-diversity, resource efficiency and management of wastes. He led the teams that wrote the India Cooling Action Plan and Draft Resource Efficiency Policy. Dr. Jain has also served in the Ministry of Petroleum and Natural Gas as Head of the Exploration Division and was responsible for the development of several significant oil and gas discoveries. During 2012-17, as Head of the Energy Division in Planning Commission (later NITI Ayog), he led several initiatives including development of the integrated modeling tool, namely the 'India Energy Security Scenarios, 2047 (IESS)'. He also led the team that drafted the National Energy Policy (2017-2040). He has also served as a Director on the Boards of leading energy sector CPSEs such as ONGC, OIL, OVL, NPCIL and BHAVINI. Dr. Anil Jain holds a BA (Honours) in Economics, an MBA and a Diploma from the Indian Institute of Foreign Trade. Dr. Jain has done his Ph.D on the topic - "Exploring the role of natural gas in India's energy mix in 2030". He has also authored two books on natural gas, largely on its prospects in India's energy mix. He has engaged extensively with international organisations like IEA, World Bank, UNEP and G-20. Dr. Jain frequently writes on energy and environmental issues and has lectured at top Universities and academic institutions in India and abroad.

Session Highlights

Dr. Anil Kumar Jain discussed the role and mandate of the Petroleum and Natural Gas Regulatory Board (PNGRB) in regulating the refining, storage, transportation, and marketing of petroleum and natural gas across India. He explained how the Board works to protect consumer interests by ensuring an uninterrupted and adequate supply of fuels and promoting transparency in retail pricing. Dr. Jain also highlighted the importance of fostering competitive markets by preventing restrictive trade practices and ensuring non-discriminatory access to essential pipeline infrastructure. In addition, he elaborated on the regulatory and administrative powers of the Board, including the enforcement of technical and safety standards for downstream infrastructure and city gas distribution networks.

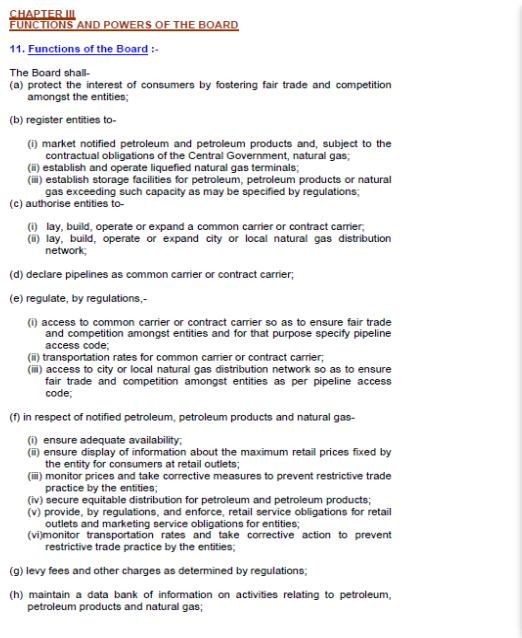
The session included an interactive discussion with participants on the following key aspects:

- Establishment of the PNGRB
- Consumer protection and promotion of competition
- Regulatory and administrative powers of PNGRB

Functions of the Board

- Protect consumer interests and promote competition.
- Register and authorize sector entities and infrastructure.
- Regulate access, tariffs, and pipeline operations.
- Ensure availability, fair pricing, and service obligations.
- Set safety standards and perform regulatory functions.

Glimpses from the Session



CHAPTER III
FUNCTIONS AND POWERS OF THE BOARD

11. Functions of the Board :-

The Board shall-
(a) protect the interest of consumers by fostering fair trade and competition amongst the entities;

(b) register entities to-

(i) market notified petroleum and petroleum products and, subject to the contractual obligations of the Central Government, natural gas;
(ii) establish and operate liquefied natural gas terminals;
(iii) establish storage facilities for petroleum, petroleum products or natural gas exceeding such capacity as may be specified by regulations;

(c) authorise entities to-

(i) lay, build, operate or expand a common carrier or contract carrier;
(ii) lay, build, operate or expand city or local natural gas distribution network;

(d) declare pipelines as common carrier or contract carrier;

(e) regulate, by regulations,-

(i) access to common carrier or contract carrier so as to ensure fair trade and competition amongst entities and for that purpose specify pipeline access code;
(ii) transportation rates for common carrier or contract carrier;
(iii) access to city or local natural gas distribution network so as to ensure fair trade and competition amongst entities as per pipeline access code;

(f) in respect of notified petroleum, petroleum products and natural gas-

(i) ensure adequate availability;
(ii) ensure display of information about the maximum retail prices fixed by the entity for consumers at retail outlets;
(iii) monitor prices and take corrective measures to prevent restrictive trade practice by the entities;
(iv) secure equitable distribution for petroleum and petroleum products;
(v) provide, by regulations, and enforce, retail service obligations for retail outlets and marketing service obligations for entities;
(vi)monitor transportation rates and take corrective action to prevent restrictive trade practice by the entities;

(g) levy fees and other charges as determined by regulations;

(h) maintain a data bank of information on activities relating to petroleum, petroleum products and natural gas;

Session 3: Energy Transition: Challenges to Grid Operation

Speaker

Mr. S. R. Narasimhan

Designation: Former Chairman and Managing Director

Organisation: Grid Controller of India Limited (Grid-India)

Educational Profile and Experience: Mr. S. R. Narasimhan is the former Chairman and Managing Director (CMD) of Grid Controller of India Limited (Grid-India), formerly known as POSOCO since 25th March 2022. After a bachelor's degree in electrical engineering in 1986, he joined BHEL, a premier power generation equipment company in India. In 1988, he moved to Central Electricity Authority (CEA), Government of India to take up Power System Operation and in 1996 moved to POWERGRID. After three decades of experience in Power System Operation spread across three control centres including National level, he joined the Grid-India Board in Nov 2018 as Director (System Operation). He has handled all facets of power system operation ranging from interconnection of regional grids, operational planning, scheduling, real time operation and event analysis besides deployment of the necessary tools for Visualization and Situational Awareness. He has also implemented several electricity market reforms in India from 2001 till date. He has contributed to several Expert Committees at the Government and regulatory levels in different areas ranging from system operation, grid integration of Renewable Energy (RE) resources, Grid Code and optimization to institution building. He is a Fellow of the Institution of Engineers, India, Senior Member of IEEE and a Distinguished Member of CIGRE. He is the Chairman of CIGRE Study Committee C2-India since 2022. He was conferred with the IEEE-PES, Delhi Chapter Outstanding Engineer Award in 2019. He has published over fifty (50) papers at the national and international level and widely travelled.

Session Highlights

Mr. S. R. Narasimhan discussed the evolving challenges of **energy transition and grid regulation**, highlighting the role of regulators and system operators in ensuring a reliable, secure, and sustainable electricity supply in a rapidly changing power system. He emphasized that increasing renewable energy penetration, distributed energy resources, and emerging electricity demand from sectors such as EVs, data centres, and green hydrogen are reshaping grid operations and regulatory frameworks. The session also highlighted the importance of grid codes, resource adequacy planning, storage integration, and well-designed electricity markets to maintain system reliability and support a smooth energy transition.

The discussion further engaged participants on key aspects including:

- Energy trilemma: sustainability, reliability, and affordability
- Climate change, extreme weather, and anthropogenic emissions
- Clean energy transition and financing requirements
- Impact of emerging loads such as EVs, electric cooking, green hydrogen, and data centres
- High penetration of distributed energy resources (DERs)
- Grid reliability challenges and international blackout case studies
- Role of electricity markets and ancillary services in ensuring grid stability

Glimpses from the Session

Session 4: Regulatory Brainstorming Session I – Experience Sharing
&
Session 8: Regulatory Brainstorming Session II – Emerging Challenges

Dr. Anoop Singh

Designation: Professor, Department of Management Sciences, IIT Kanpur, Founder & Coordinator, Energy Analytics Lab (EAL) and Centre for Energy Regulation (CER)

Organisation: Department of Management Sciences, IIT Kanpur

Educational Profile and Experience: PhD, M.Tech (Industrial Engineering) and B.Tech (Mechanical Engineering)

Prof. Anoop Singh is a Professor in the Department of Management Sciences. He is the founder of the Centre for Energy Regulation (CER) and the Energy Analytics Lab (EAL) at IIT Kanpur. He has about 24 years of experience covering regulatory and policy aspects of the power sector in the Indian as well as international context covering power market design, renewable energy, regulatory governance, energy pricing, electricity derivatives, market monitoring, cross border electricity trade, carbon market and climate policy modelling.

He is currently an Independent Director of M.P. Power Management Company Limited and member of the NITI Aayog's Energy Modeling Forum, member of the Advisory Committee of the Central as well as some of the State /Joint Electricity Regulatory Commissions.

He has contributed with over 180 regulatory and policy submissions to various Ministries, Electricity Regulatory Commissions, NITI Aayog and Central Electricity Authority (CEA,) and has undertaken research projects for MoP, CERC, selected SERCs, NITI Aayog, ADB, World Bank, UNIDO, and UNU/IAS.

He has five books and numerous publications to his credit. He is editor of Regulatory Insights – a quarterly periodical of CER, and Power Chronicle – a quarterly periodical of EAL. He is also Coordinator of eMasters Degree Program of IIT Kanpur on "Power Sector Regulation, Economics and Management".

He is on the board of the Indian Association of Energy Economics (I-AEE), and was its founding Board Member and Vice President (Conferences).

Session Highlights

Dr. Anoop Singh led a Regulatory Brainstorming Session, focusing on key issues shaping the future of the power sector. He emphasized the need for innovative regulatory approaches to address emerging challenges related to market design, capital investment decisions, renewable energy integration in the sector. The session encouraged participants to share perspectives and engage in discussions on regulatory reforms, financial sustainability, and optimization of system resources. Dr. Singh highlighted the importance of balancing regulatory certainty with flexibility to support sector growth and evolving market structures.

Key topics discussed during the session included:

- Regulatory Sandbox for testing innovative regulatory approaches
- CAPEX vs OPEX considerations in utility investments
- Capitalization practices in the power sector
- Market design and emerging electricity market frameworks
- Economics of hydro power generation
- RCO / RPO compliance mechanisms
- Return on Equity (RoE) in regulated utilities
- Market-Based Economic Dispatch (MBED)
- Carbon market development
- National Electricity Policy (NEP)
- X-Factor and Deviation Settlement Mechanism (DSM)
- Regulatory risks and cost optimization potential in the sector

Glimpses from the Session

Day 2

Session 5: Regulatory Governance Framework in Infrastructure Sector in South Asia

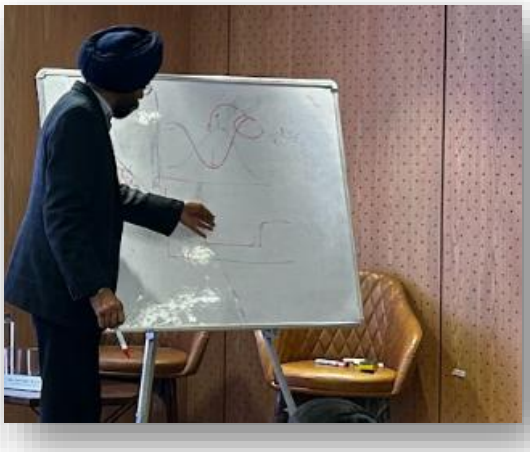
Session Highlights

Dr. Anoop Singh discussed the importance of **strong regulatory governance frameworks** for infrastructure sectors, particularly electricity, which often operate as natural monopolies requiring high capital investment and long asset life cycles. He highlighted that effective regulation depends on a clear legal and institutional framework, supported by strong regulatory independence, adequate financial and human resources, and well-defined roles among the government, regulators, and utilities. The session also emphasized the need for institutional capacity, transparency, and accountability to ensure credible and efficient regulatory oversight. Dr. Singh further engaged participants in discussions on how robust regulatory governance can support sectoral sustainability, economic efficiency, and stakeholder confidence while adapting to emerging challenges such as renewable energy integration, digitalization, and evolving market structures.

Key topics discussed during the session included:

- Natural monopoly characteristics of infrastructure sectors and high capital investment requirements
- Legal foundations for independent regulation under sectoral laws such as the Electricity Act
- Clear definition of roles and functions among government, regulators, and utilities
- Importance of regulatory independence for transparent decision-making
- Need for adequate financial resources and skilled manpower in regulatory institutions
- Building institutional capacity through technical expertise and sectoral experience
- Strengthening accountability mechanisms to maintain public trust and regulatory credibility

Glimpses from the Session



Session 6: Infrastructure to Support Clean Energy Transition: EV Charging

Speaker

Mr. D. K. Srivastava

Designation: Chief Engineer

Organisation: Ministry of Power (MoP)

Educational Profile and Experience: Shri Dhiraj Kumar Srivastava is an officer of the Central Power Engineering Services (CPES), 1997 Batch. He holds a B.E. in Electrical Engineering (1993) and an M.Tech. in Control Systems (1996). He is currently serving as Chief Engineer, Energy Conservation, Energy Transition and Electric Vehicle in the Ministry of Power.

He has served as Assistant Director, PSTI Bengaluru; Assistant Executive Engineer, NERPC; Deputy Director, CEA; Officer on Special Duty, POWERGRID; Director, National Power Committee; Director (Transmission), Ministry of Power; Electrical Inspector to the Government of India (Northern Region); and Chief Engineer (Thermal Engineering), CEA. His professional roles include working as a Design Engineer at Tata Consulting Engineers, improving training of power engineers (1999), formulating guidelines for accreditation of training institutes under Ring Fencing of Load Despatch Centres (2010), developing grid connectivity regulations for renewable energy (2013), contributing to technical standards regulations for O&M of substations and grid connectivity of renewable energy sources, serving as Nodal Officer for the Grid Enquiry Committee during the grid failure of 30–31 July 2012, handling grid security and inter-regional operational and commercial issues, framing electric supply safety and construction regulations, conducting safety audits of thermal power plants, contributing to cross-border electricity trade guidelines, spearheading the national Biomass Co-firing initiative, developing Flexible Operation Regulations for thermal power plants, formulating EV Charging Station Guidelines (2024), contributing to the framework for the Indian Carbon Market, upgrading Minimum Energy Performance Standards (MEPS) including cooling, preparing CAFÉ norms, developing energy conservation norms for appliances, energy conservation and sustainable building codes, implementation of Renewable Energy Consumption Obligations, and work related to the India Cooling Action Plan.

Session Highlights

Mr. D. K. Srivastava discussed the evolving **regulatory framework for EV charging infrastructure**, emphasizing its importance in supporting India's energy transition and the electrification of transport. He highlighted that effective regulation is essential to create a standardized, safe, commercially viable, and grid-compatible ecosystem for electric mobility. During the session, he explained how the **EV Charging Infrastructure Guidelines–2024** consolidate policy, technical, tariff, safety, and governance provisions into a unified framework to accelerate EV adoption and infrastructure deployment. Mr. Srivastava also engaged participants in discussions on the legal, regulatory, and operational aspects required to ensure grid readiness, renewable energy integration, and investor confidence in the EV ecosystem.

Key topics discussed during the session included:

- India's energy and fuel landscape
- Energy transition and electrification of transport
- EV Charging Infrastructure Guidelines–2024
- Legal and regulatory framework
- Technical and safety standards
- Tariff principles and service charges
- Public land allocation and density norms
- Smart charging, V2G (Vehicle-to-Grid), and solar integration
- Data sharing and development of a national EV database

Glimpses from the Session

Session 7: Regulatory Process and Dispute Resolution

Speaker

Mr. Sanjay Sen

Designation: Senior Advocate

Educational Profile and Experience: Sanjay Sen is Senior Advocate and is currently based in Delhi. In addition to leading the development of electricity law, he has extensively engaged in commercial and corporate litigation involving infrastructure projects across multiple sectors. His experience includes handling matters related to state concessions, resolving disputes concerning major ports, addressing environmental issues, and more. Sanjay regularly represents electricity majors like Adani Power, CESC Group, Vedanta, Balco, JSPL, JSW, Sterlite Grid etc.. In the renewable energy space, Sanjay represents Suzlon, ReNew Power, Greenko, Adani Green, Tata Power Renewable, IWPA etc. before the Tribunal, various High Courts and the Supreme Court of India. Sanjay also advises and represents Central and State PSUs like NTPC, PGCIL and MAHAGENCO before various forums. Sanjay is a law graduate from the Campus Law Centre, University of Delhi. After completing his graduate degree in law in 1992, Sanjay enrolled as an Advocate in the Bar Council of Odisha. Later Sanjay practiced law in the High Court of Judicature at Calcutta before joining the University of Edinburgh for a Master degree in law. In the LLM program Sanjay specialized in World Trade Laws and International Commercial Arbitration. After devilling in chambers in Kolkata and Delhi, in 2005 Sanjay went on to establish a boutique law firm specialising in infrastructure advisory and regulatory practice. As a part of such practice, Sanjay led several banks and financial institutions as lender's counsel for financing of projects. He also advised on risks and related issued to international construction company – Leighton Holdings for their Indian joint ventures projects in the road sector. On being designated as Senior Advocate in February 2013, Sanjay resigned from the law firm as its founder and managing partner and settled for an independent counsel practice. Mr. Sen is currently advising the Department of Energy, Government of Odisha on various policy and regulatory issues concerning the energy sector and has been given the rank of Chief Secretary. Sanjay's personal interests include writing on topical issues, travelling, exploring wildlife parks, reading and music.

Session Highlights

Mr. Sanjay Sen discussed the statutory powers of Electricity Regulatory Commissions under the **Electricity Act, 2003**, highlighting key judicial decisions that clarify their rule-making, adjudicatory, and supervisory roles. He explained how regulatory commissions exercise authority through regulations, orders, and oversight of sectoral agreements, while maintaining transparency, stakeholder consultation, and procedural fairness. The discussion also emphasized the balance between regulatory intervention and contractual autonomy, particularly in matters related to tariffs, PPAs, and dispute resolution.

Key topics discussed:

- Powers of Electricity Regulatory Commissions under the **Electricity Act, 2003**
- Regulation-making authority under **Sections 178 and 181**
- Judicial interpretation of regulatory powers (*PTC India Ltd. v. CERC*, ABT–UI rulings)
- Delegated legislation and stakeholder consultation
- Adjudicatory role under **Sections 79 and 86**
- Regulatory oversight of **PPAs** and contractual arrangements

Glimpses from the Session

Day 3

Session 9: Regulation of Cross-Border Energy Trade and Regional Power Market

Speaker

Mr. Ghanshyam Prasad

Designation: Chairperson

Organisation: Central Electricity Authority, Ministry of Power

Educational Profile and Experience: Mr. Ghanshyam Prasad (DoB: 15/05/1967) is presently holding the post of Chairperson and Ex-Officio Secretary to the Government of India, Central Electricity Authority, Ministry of Power from 15th July 2022. He is also the Member, ex-officio, of the Central Electricity Regulatory Commission. He belongs to the Central Power Engineering Services batch of 1989. Prior to this he was holding the post of Joint Secretary in the Ministry of Power from 1st June 2020. He has served in the Ministry of Power for around 9 years in various capacities, i.e. Director (OM, Transmission) and Chief Engineer (OM, Transmission, Reforms & Restructuring and Regulatory Compliance Monitoring). He did his graduation in B.Tech (Electrical Engineering) for IIT/BHU, Benares Hindu University. He holds a M.Tech in Energy and Environment Management from IIT, Delhi and also a MBA(Finance) from IGNOU, Delhi. He has served 30 years in power sector and three years in the Bokaro Steel Plant, SAIL. During 30 years in power sector, he has worked and contributed in the areas of generation including the renewable energy, transmission, distribution, power market development/trading of power, Reforms & restructuring in power sector, energy efficiency, regulatory commission experience, disaster management in power sector, data analytics and information management system. A number of measures were taken to reduce the cost of power, ease of doing business, simplification of the procedures for approvals, bringing competition in power sector etc. He has also served in Haryana Electricity Regulatory Commission for around six years and brought out new regulations. He also has corporate experience and was Government Nominee Director of Power Grid Corporation of India Limited (PGCIL), a Maharatna Company; Power System Operation Corporation Limited (POSOCO); and Jammu and Kashmir State Power development Corporation Limited (J&KPDCL). Presently he is the Director on the Board of Nuclear Power Corporation of India Limited in an ex-officio capacity.

Session Highlights

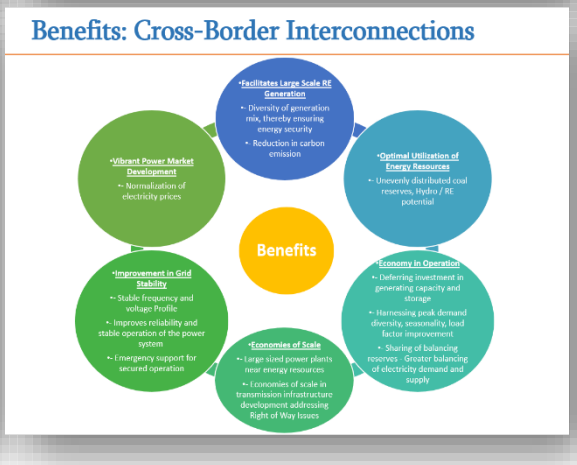
Mr. Ghanshyam Prasad discussed the evolving framework of **cross-border electricity trade (CBET)** and its role in strengthening regional power cooperation in South Asia. He explained how interconnected national grids enable real-time balancing, resource optimization, and mutually beneficial electricity exchange among neighboring countries. The discussion highlighted how hydro-rich countries such as Bhutan and Nepal can export surplus clean energy, while countries facing deficits, such as Bangladesh, can meet demand through flexible bilateral or multilateral trade arrangements.

Key topics discussed during the session:

- Cross-Border Electricity Trade (CBET) framework
- Guidelines on Import/Export of Electricity
- Cross-border transmission interconnections with India
- One Sun, One World, One Grid initiative
- Deregulation and reducing litigation in the power sector

The session emphasized that cross-border electricity trade can enhance regional energy security, support renewable energy integration, and optimize resource utilization, while requiring harmonized regulations, stronger grid coordination, and digitalized power system operations.

Glimpses from the Session



Session 10: Regulation of Telecom and Digital Payment Infrastructure

Speaker

Dr. M.P Tangirala

Designation: Member, Telecom Regulatory Authority of India

Educational Profile and Experience: Dr M P Tangirala is a former officer of the Indian P&T Accounts and Finance Service (1990 batch). He joined government service after obtaining a BE in civil engineering from College of Engineering, Guindy, and a PGDM from IIM Calcutta, and working briefly with an advertising agency. He is also alumnus of Osmania University (law), Indian Institute of Public Administration, and Jawaharlal Nehru University, where he obtained his PhD in law and governance. His PhD thesis on Institutional aspects of regulatory governance: A case study of the Indian telecom services sector, was published as a book, Telecom Sector Regulation in India: An Institutional Perspective, by Routledge in 2019. He has also authored scholarly articles and opinion pieces on various subjects. In his career in government, he has worked in different functional areas of telecom policy, law, and regulation, administration, personnel management and training, insurance regulation, and financial services. He has extensive regulatory work experience, having worked for three stints in TRAI (as Director, Advisor, and Principal Advisor), and once as Executive Director in the Insurance Regulatory and Development Authority of India (IRDAI). He has served in different capacities in the Department of Telecommunications, Bharat Sanchar Nigam Limited (BSNL), and Union Public Service Commission (UPSC), and as Additional Secretary in the Department of Financial Services (DFS). He has been on the government nominee director on the Board of, among others, Tata Communications Ltd, BSNL, Indian Bank, Bank of Baroda, National Bank for Agriculture and Rural Development (NABARD), Life Insurance Corporation of India (LIC), and General Insurance Corporation of India (GIC Re). He was also Part-Time Member, IRDAI during his stint in DFS. His telecom sector expertise spans revenue assurance, information technology applications, financial advice for procurements/ contracts, training, licensing policy, spectrum valuation, tariff regulation, vigilance, and policy litigation. He has an abiding interest in the economics of regulation, and the institutional interplay between different stakeholders in the regulatory landscape.

Session Highlights

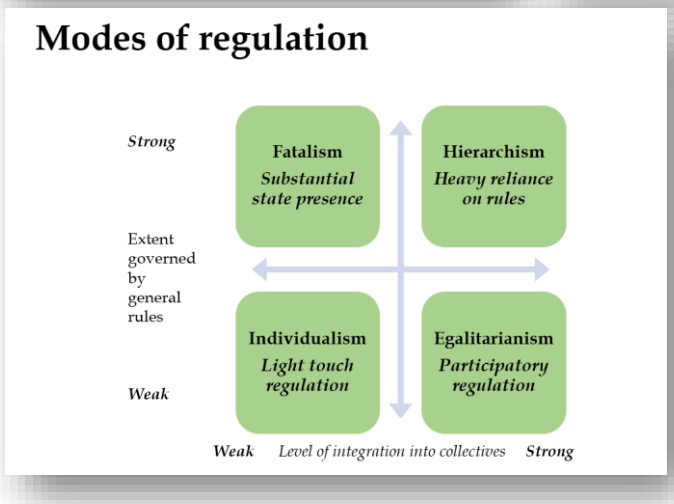
Dr. M. P. Tangirala discussed the concept of regulation as a mechanism through which the state intervenes in the economy to manage long-term relationships among stakeholders by establishing legal frameworks, regulatory incentives, and institutions responsible for implementation and compliance monitoring. Using the telecom sector as an example, he explained how India's regulatory architecture has evolved through statutory reforms, institutional development, and judicial interpretation. The discussion also highlighted the growing role of telecom infrastructure in enabling **Digital Public Infrastructure (DPI)** and supporting inclusive digital services.

Key topics discussed during the session:

- Statutory framework governing the telecom sector
- Role of the **Telecom Regulatory Authority of India (TRAI)**
- Functions of the **Telecom Disputes Settlement and Appellate Tribunal (TDSAT)**
- Key case studies in telecom regulation
- Digital Public Infrastructure and its policy implications

The session highlighted that India's telecom regulatory framework anchored in laws such as the **TRAI Act, 1997**, **Telecommunications Act, 2023**, and the **Cable Television Networks (Regulation) Act, 1995** has evolved through continuous reforms and institutional strengthening, enabling rapid digital transformation and improved service delivery

Glimpses from the Session



Session 11: Regulatory Framework and Prospects for Transport (Ports & Railways)

Speaker

Dr. G Raghuram

Designation: Professor (Emeritus)

Organisation: Chanakya University and the Gujarat Maritime University
Educational Profile and Experience: Dr. Raghuram is a Professor (Emeritus) of Chanakya University and the Gujarat Maritime University. He is visiting faculty at IIM Ahmedabad, IIM Bangalore, IIM Visakhapatnam, Indian Institute of Science, Gati Shakti Vishwavidyalaya, and Gujarat National Law University. He is associated with the Akshaya Patra Foundation and the Infrastructure Vision Foundation.

He has been Director, IIM Bangalore, from February 2017 to July 2020. Prior to that, he was Professor and Chairperson of the Public Systems Group at IIMA. He has been Dean (Faculty), IIMA; Vice-Chancellor of the Indian Maritime University and Indian Railways Chair Professor at IIMA.

He specializes in infrastructure and transport systems, and logistics and supply chain management. He conducts research on the railway, port, shipping, aviation, and road sectors. He has been part of various government policy making and advisory committees, and Boards of companies, higher educational and social institutions and continues to be on some.

Dr. Raghuram has a B. Tech from IIT Madras; a Post Graduate Diploma in Management from IIM Ahmedabad; and a PhD from Northwestern University, USA.

Session Highlights

Dr. G. Raghuram discussed the regulatory frameworks governing ports and railways, emphasizing the role of the State in structuring infrastructure markets through statutory authority, concession agreements, safety oversight, pricing mechanisms, and institutional coordination. He explained how effective regulation helps manage long-term public–private partnerships, improve operational efficiency, safeguard consumer and national interests, and support sustainable logistics development. The session also engaged participants in discussions on recent reforms, sector performance, and the need for independent regulatory mechanisms to strengthen infrastructure governance.

Key topics discussed during the session:

- Significance and growth of Indian ports
- Global comparisons in cargo and container traffic
- Port efficiency and vessel turnaround time
- Maritime sector challenges and PPP frameworks
- Indian Ports Bill, 2025 and recent maritime legislation
- Current status and reforms in Indian Railways
- Freight share, electrification, and market realities
- PM Gati Shakti National Master Plan
- Rail regulatory framework and the concept of a Rail Development Authority (RDA)

Glimpses from the Session

Valedictory Function

Chief Guest

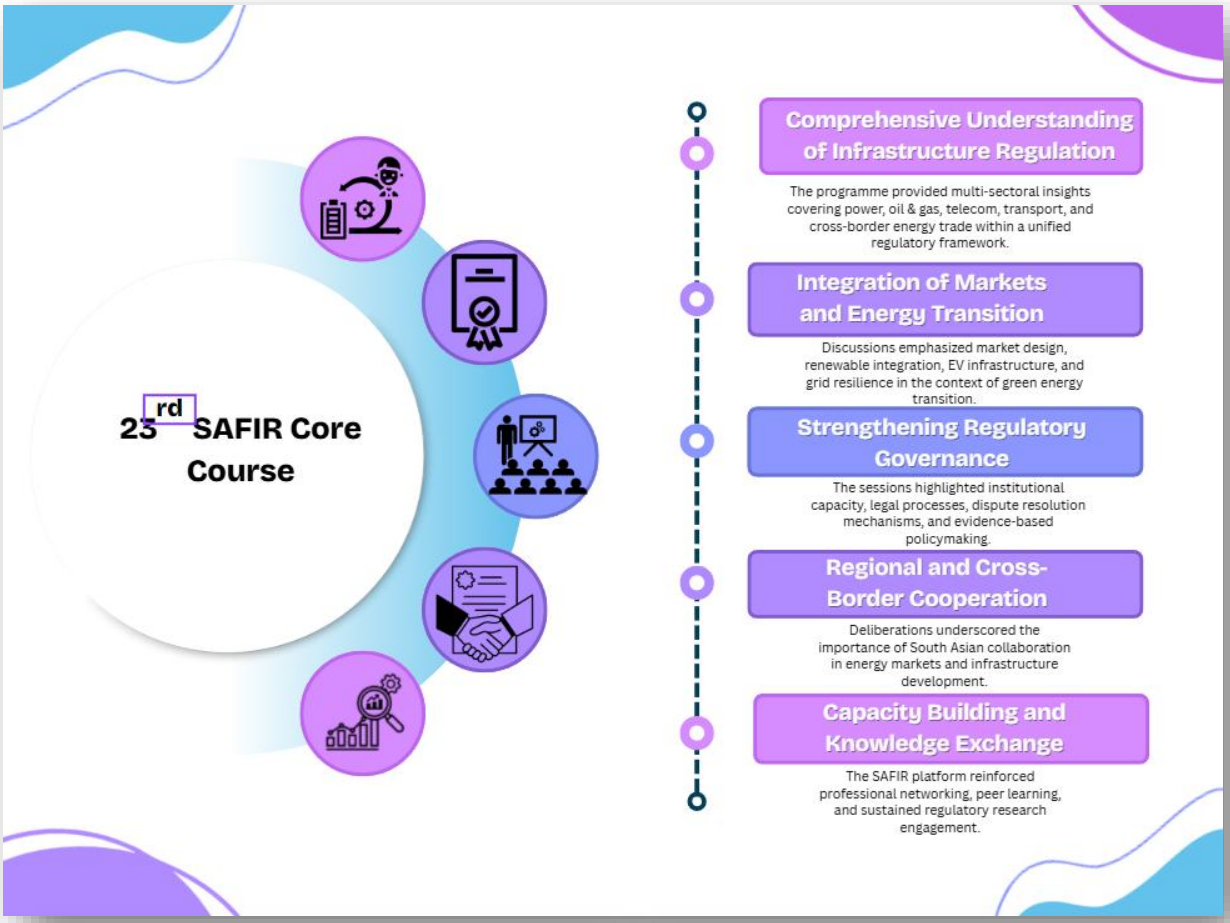
Mr. Jisnu Barua

Designation: Chairperson

Organisation: Central Electricity Regulatory Commission

Educational Profile and Experience: Mr. Jishnu Barua is a former Civil Servant, who had joined the Indian Administrative Service (IAS) in 1988 and allocated the Assam-Meghalaya cadre. Mr. Jishnu Barua has served in several capacities in the State Government of Assam and the Central Government. He had served in the Power Department, Govt. of Assam as Principal Secretary/Additional Chief Secretary in 2017-2018 and was also Chairman of the State Distribution, Transmission and Generation Companies. Eventually, Mr. Barua was elevated to the post of Chief Secretary to the Government of Assam and superannuated from service as Chief Secretary in August 2022. While being posted as Chief Secretary he had concurrently held charge as Chairman, Assam Power Distribution Company Ltd (APDCL). Mr. Jishnu Barua was appointed as Chairperson, Central Electricity Regulatory Commission (CERC) from 2nd March, 2023. CERC, a key regulator of power sector in India, is a statutory body functioning with quasi-judicial status under the Electricity Act, 2003.

Glimpses from the Session

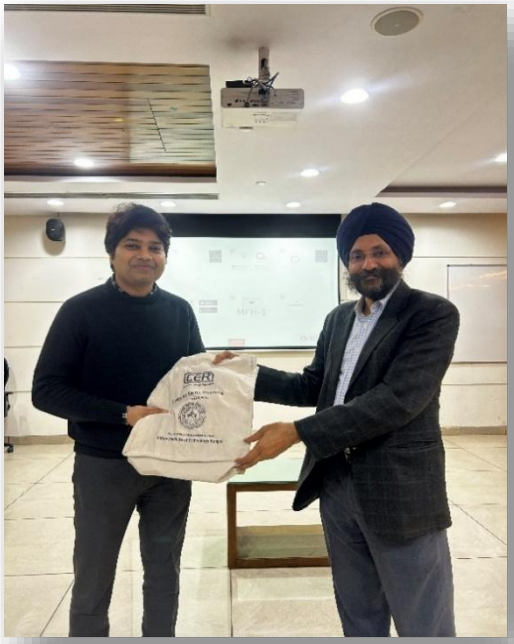


Field Visit to NPCL

During our visit to Noida Power Company Limited, the officials provided a detailed presentation on the company's operational performance, digital transformation initiatives, and consumer service mechanisms. The session highlighted how an efficient distribution utility manages electricity supply, maintains financial sustainability, and improves customer engagement through the adoption of modern technologies.

Key topics covered during the session:

- Distribution operations, peak load management, and energy sales
- Consumer mix and rural electrification
- Tariff structure and maintaining lower tariffs without subsidies
- Operational efficiency, including low T&D losses and high billing efficiency
- Digital initiatives: ERP, GIS mapping, SCADA, and automated meter reading
- Smart meters and Advanced Metering Infrastructure (AMI)
- Online billing, digital payments, and consumer service platforms
- Data analytics, AI, predictive maintenance, and smart grid plans
- Consumer grievance redressal mechanisms and helpline services



Field Visit to GRID-INDIA

During our visit to the National Load Despatch Centre, the officials delivered a detailed session on the functioning of the Indian power system and the role of system operators in maintaining grid reliability and facilitating electricity markets. The session provided an overview of the institutional structure of the Indian power sector, the evolution of the national grid, and the operational responsibilities of Grid Controller of India Limited in ensuring secure and efficient system operation.

Key topics covered during the visit:

- Institutional structure and policy roles in the Indian power sector
- Evolution of the Indian grid and independent system operation
- Core functions of GRID-INDIA and system operation activities
- Automatic Generation Control (AGC) and grid frequency management
- Structure and evolution of the Indian electricity market
- Market access and contractual frameworks under GNA
- Renewable energy integration and operational challenges
- Emerging issues: AI, cybersecurity, distributed RE, and data analytics
- National Open Access Registry and SCED for efficient dispatch
- India's energy transition and large-scale renewable integration strategies

Participants of SAFIR 23rd Core Course with Chief Guest ***Mr. Jishnu Barua*** Chairperson, Central Electricity Regulatory Commission and ***Mr. Harpreet Singh Pruthi***, Secretary, Central Electricity Regulatory Commission along with ***Dr. Anoop Singh***, Professor IIT Kanpur, Founder of Centre for Energy Regulation and Energy Analytics Lab IIT Kanpur

The CER team, along with the Chief Guest, ***Mr. Jishnu Barua***, Chairperson, Central Electricity Regulatory Commission, and ***Dr. Anoop Singh***, Professor IIT Kanpur and Founder Centre for Energy Regulation and Energy Analytics Lab, IIT Kanpur.
CER Team- ***Aman, Sanjit, Vivek, Himanshu, Nainsy, Muskan, Mohit, Mrudul***

Prof. Anoop Singh expressed his sincere appreciation to the Centre for Energy Regulation team for their contributions to coordination, event management, and the effective organization of the programme. He commended Himanshu, Muskan, Vivek, Nainsy, and Mrudul for their significant roles in report preparation, management, and the overall execution of the programme. He also acknowledged Garima for her valuable IT support.

Participant Feedback Analysis Report

1. Overview

Feedback from participants was collected at the end of each session to evaluate the effectiveness of the programme. The evaluation was conducted using a five-point rating scale, where 1 represents the lowest level of satisfaction and 5 represents the highest level of satisfaction.

Participants evaluated the sessions based on scope of the topic, technical depth of the presentation, response to participants' questions, and overall rating of the session.

2. Overall Feedback of the Program

Question	Evaluation Parameter	Average Score	Minimum Score	Maximum Score
Q1	Scope of the topic	4.70	4.00	5.00
Q2	Technical depth of the presentation	4.68	4.00	5.00
Q3	Response to participants' questions	4.81	4.00	5.00
Q4	Overall rating of the session	4.71	4.00	5.00

3. Day 1 – Session Feedback

Question	Dr. Sushanta K. Chatterjee	Dr. Anil Kumar Jain	Mr. S. R. Narsimhan	Brainstorming I (Dr. Anoop Singh)
Q1	4.80	4.68	4.93	-
Q2	4.72	4.81	4.96	-
Q3	4.62	4.87	4.86	-
Q4	4.84	4.84	4.93	4.88

4. Day 2 – Session Feedback

Question	Dr. Anoop Singh	Mr. D. K. Srivastava	Mr. Sanjay Sen	Brainstorming II
Q1	4.59	4.36	4.80	-
Q2	4.62	4.20	4.87	-
Q3	4.85	4.50	4.87	-
Q4	4.65	4.24	4.90	4.91

5. Day 3 – Session Feedback

Question	Mr. Ghanshyam Prasad	Mr. M. P. Tangirala	Dr. G. Raghuram
Q1	4.91	4.86	4.73
Q2	4.95	4.75	4.73
Q3	4.91	4.89	4.89
Q4	4.91	4.81	4.84

6. Day 4 – Field Visit Feedback

Session	Overall Rating (Q4)
Field Visit – NPCL	4.91
Field Visit – GRID INDIA	4.71

7. Key Insights

- All sessions received ratings above 4.2 indicating strong participant satisfaction.
- The highest score was recorded for response to participant questions.
- Expert sessions and interactive discussions received excellent feedback.
- Field visits significantly enhanced practical learning.

IIT Kanpur: Indian Institute of Technology Kanpur

IIT Kanpur's lead on Regulatory and Policy Research, and Energy Sector Modelling and Analytics

Centre for Energy Regulation (CER)

Energy Analytics Lab (EAL)

Department of Management Sciences
Indian Institute of Technology Kanpur

About Centre for Energy Regulation (CER)

The Centre for Energy Regulation (CER) is an endeavor towards comprehensive and sustained institutional strengthening in the Indian power sector. It is an initiative led by the Department of Management Sciences at Indian Institute of Technology Kanpur (IITK), which has been actively engaged in education, research, capacity building, consulting and policy advisory related to energy/power sector. Centre for Energy Regulation (CER) was set up in 2017, through seed funding by the UK Government through the project on "Strengthening Regulatory Research & Network in the Power Sector". The Centre work in close cooperation with key stakeholders in the Indian power sector, particularly the Electricity Regulatory Commissions (ERCs), electric utilities and academia.

Verticals of CER

Regulatory & Research Policy

Capacity Building

Regulatory Knowledge Base

Regulatory Research Areas

The CER engages in regulatory research and policy analysis covering a wide variety of current as well as emerging issues, particularly in the context of the Indian power sector. The key research focus areas are power market development, resource adequacy, RE integration, tariff regulations, regulatory governance, etc.

Regulation and Policy	Power Market Development	RE Integration and Smart Grid
• Regulatory governance • Tariff determination framework for generation, transmission, and distribution • Performance benchmarking for electricity distribution utilities • Incentive design for performance • Transmission access and transmission pricing • Energy transition and climate policy modelling • Distributed energy resources/peer to peer market • Determination of cost of capital /return on equity	• Resource adequacy • Long-term demand forecasting • Market simulation modelling • Demand side management • Cross border trading of electricity • Power Market Derivatives • Market based economic dispatch (MBED) • Security Constrained Economic Dispatch (SCED) • Deviation settlement mechanism • Ancillary services market • Distribution System Operators (DSOs) • Market monitoring analytics • Electric vehicle (EV) and modelling of EV charging • Market based PPAs	• RE and storage modelling • Renewable energy policy modelling • Flexibility • Renewable power obligation (RPO) • Renewable energy certificate (REC) mechanism • Design and sizing of mini grid programs • Rooftop solar • Green hydrogen • Smart meter tariff design • Smart grid and mini grid policy • Indian carbon market • Energy saving certificates (ESCerts)

CER's Key Institutional Collaborations

S. No.	Research assignments	Stakeholder
1	Policy research to Identify Interventions for Reducing Disputes in the Indian Power Sector	विद्युत मंत्रालय MINISTRY OF POWER
2	Normative Tariff Framework for Tariff Determination of Inter-State Generating Stations for the Control Period of 2024-29	CERC
3	Development and Management of Regulatory Tool	FORUM OF REGULATORS
4	Improving the Effectiveness of Regulatory Framework in Electricity Sector	NITI Aayog
5	Developing Energy-Economy-Environment Policy Modelling: MESSAGEix for climate energy regulatory policy	NITI Aayog

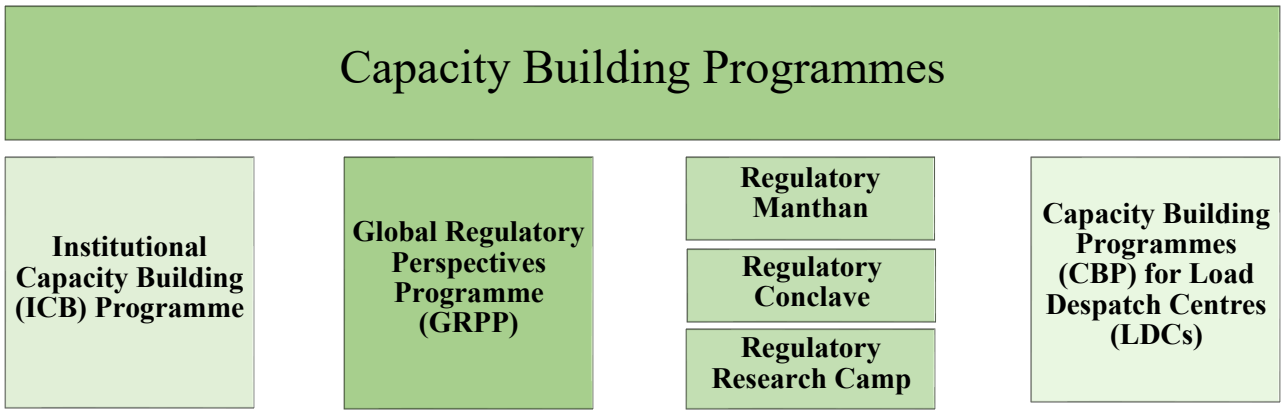
6	US India collaborative for Smart Distribution System with Storage	
7	Regulatory Framework for Long-Term Demand Forecasting and Power Procurement Planning	
8	Long-term Demand Forecasting and Power Procurement Planning	
9	Developing Power Market Derivatives for the Indian Power Market	
10	Rajasthan Energy Scenario for 2030 and 2050	
11	Analysis of Market Bid Data for Market Monitoring	

A number of public institutions and government bodies, both at national and international levels, have shown their confidence in CER, along with EAL, in entrusting analytical, modelling, regulatory and policy-based assignments.

The outcome of the above research studies have effectively contributed in shaping the policy and regulatory initiatives in Indian respective context as it strengthen CER ability to contribute to wider experience across the sector. CER expects to continue to engage in relevant activities with support from entities having interest in energy/power sector.

Capacity Building Programmes

CER regularly conducts both offline and online programmes to engage with a wide range of stakeholders through tailored capacity-building programmes (CBPs) and stakeholder consultations. The design of individual programmes varies from a few hours to several weeks, depending on the programme objectives, scope, target audience, depth of engagement, and hands-on activities.

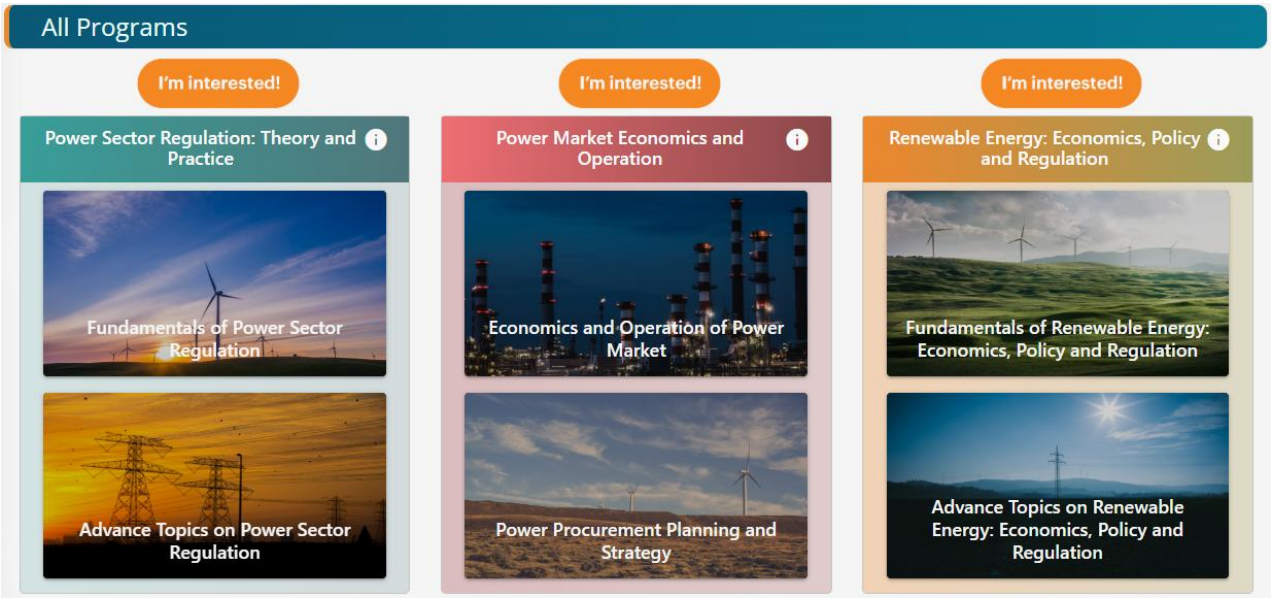


Regular engagement with key stakeholders, through such programmes, has ensured that the sector's need for skilled human resources are addressed from time to time. A proud alumni of more than 1,000 professionals, researchers, and students stands as a testament to IIT Kanpur's leadership in regulatory and policy aspects of the energy/power/infrastructure sectors.

Regulatory Certification Programmes (RCP)

- The program content is delivered through recorded, live and live interactive sessions through online mode.
- The live/ interactive sessions are scheduled in the evenings and over the weekends.
- More than 25 hours of content is delivered over 2-3 weeks.
- Performance during online exam, attendance, and interactions during live sessions form criteria for award of **Certificate of Achievement** or **Certificate of Participation.**

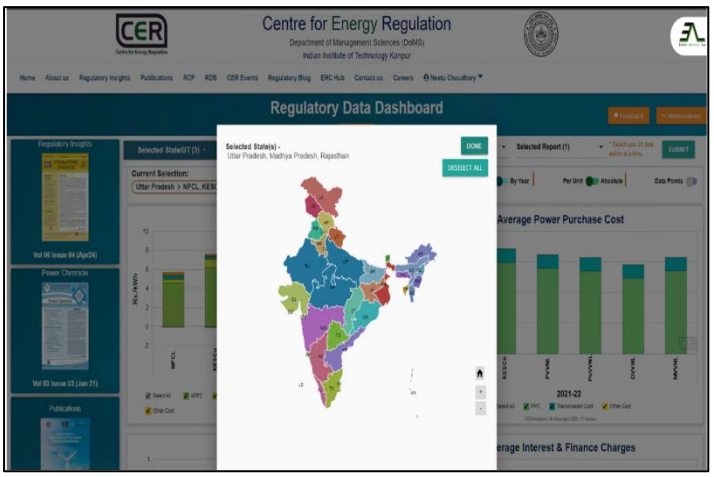
More information Link….

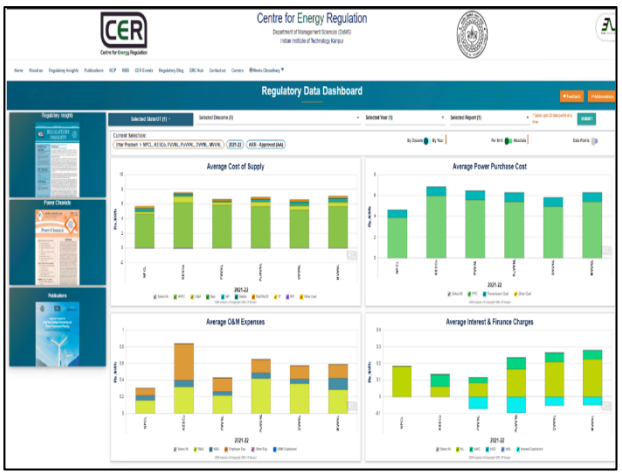


The programs, delivered in online mode, are designed for working professionals as well as researchers and students. The programs are suitable for officials of Regulatory Commissions, Government, Public and Private sector including Generation Companies (Thermal, Hydro and RE), Licensees (Transmission, Distribution and Trading), System Operators, Open Access Consumers, Equipment Manufacturers, Infrastructure Companies, Banks & Financial Institutions, Insurance, Pension & Investment Funds, Consultants, Academicians and stakeholders working across energy/ power sector supply chain including Green Hydrogen, Storage, EV, Coal, Oil & Gas, etc.

Regulatory Knowledgebase:

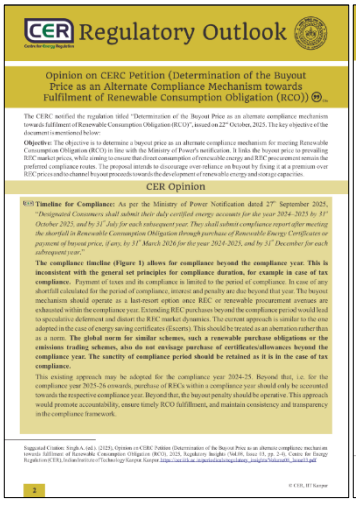
Regulatory Data Dashboard – In-house developed tool: CER's Regulatory Data Dashboard is designed to leverage various data's (ACoS, ARR, etc.) to provide a visualized snapshot of the techno-commercial aspects associated with the regulated business across generation, transmission, and distribution segments in India.

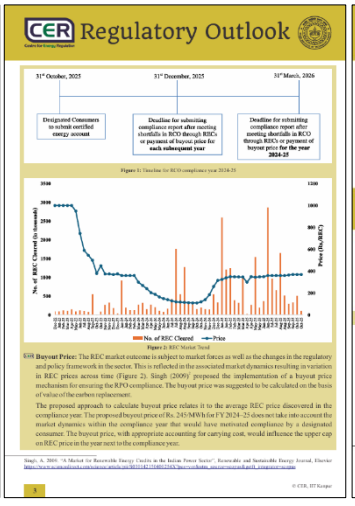


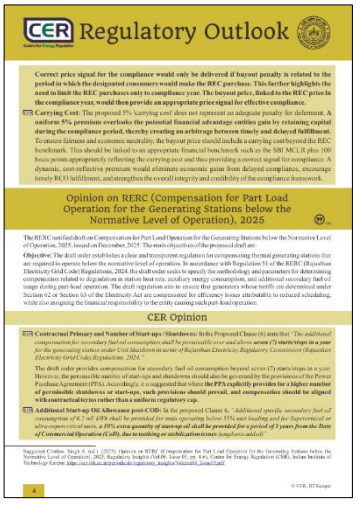


Regulatory Insights:

CER's *Regulatory Insights* (ISSN: 2583-2182 (O)), the flagship quarterly periodical, showcases its regulatory and policy insights, findings of regulatory research, and snapshots of key regulatory and policy developments across the Indian power sector. *Regulatory Insights* reaches more than 5,000 decision makers, regulators, policymakers, sector leaders, investors, as well as the larger research community at the national and international level.







Scan QR code to read Regulatory Insights

For any collaboration enquiry, write to anoops@iitk.ac.in.

Energy Analytics Lab (EAL)

The Energy Analytics Lab (EAL), supported by CSR funding from the Indian Energy Exchange Ltd., is an industry supported academic initiative of the Department of Management Sciences (DoMS), IIT Kanpur. The EAL aims at building power market database, and developing learning and visualization tools for the same.

Key Objectives

The main objectives of the Energy Analytics Lab (EAL) include the following:

- Develop learning and visualization tools for the power market and power system modeling.
- Quality data analysis and modelling for decision making.
- Provide research-based inputs to policy makers, regulators and sector stakeholders.

EAL, IIT Kanpur: A Leading Research Lab on Energy Data Analytics and Modelling

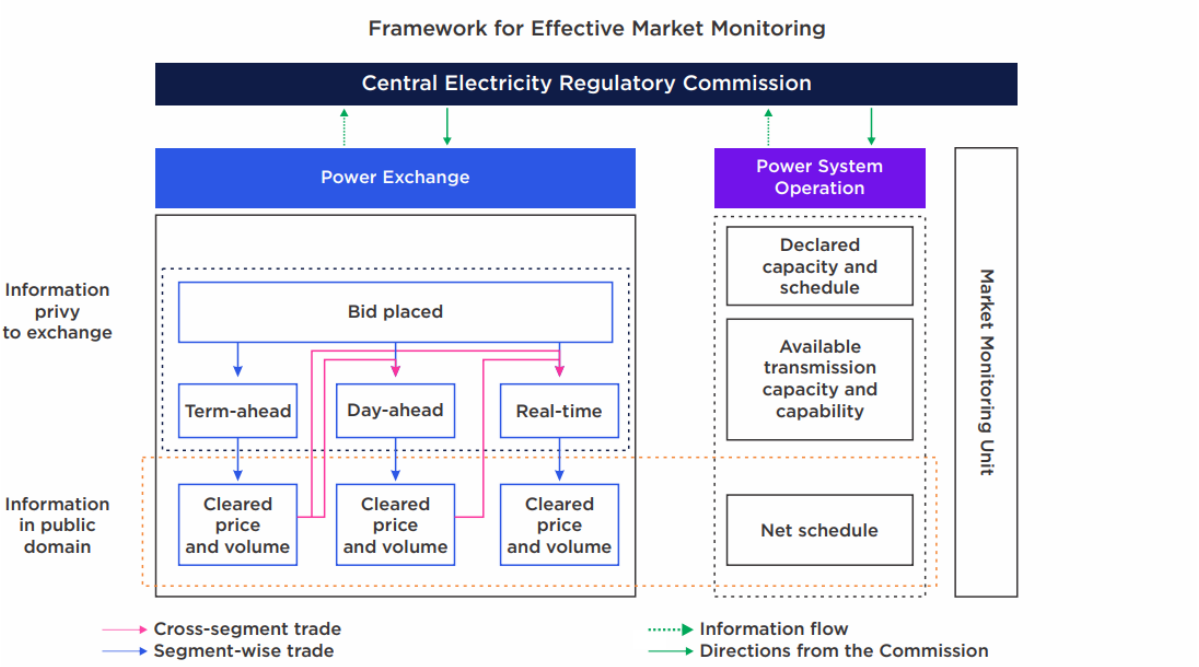
Recent Projects and Achievements

- **Long-term demand forecasting and Power Procurement Planning & Resource Adequacy**: EAL successfully completed studies for ***Uttar Pradesh, Chhattisgarh, and Rajasthan*** in collaboration with Uttar Pradesh Power Corporation Ltd., UP Electricity Regulatory Commission, Chhattisgarh State Electricity Regulatory Commission and add Rajasthan appropriate authority name, respectively.

- **Resource Adequacy Framework for Distribution Utilities: Methodological and Implementation Issues:** EAL proposes a Resource Adequacy framework for Indian DISCOMs to maintain reliability with rising renewable penetration. It strengthens demand and peak forecasting, uses metrics like Planning Reserve Margin, and assesses capacity credits and captive generation impacts on procurement.

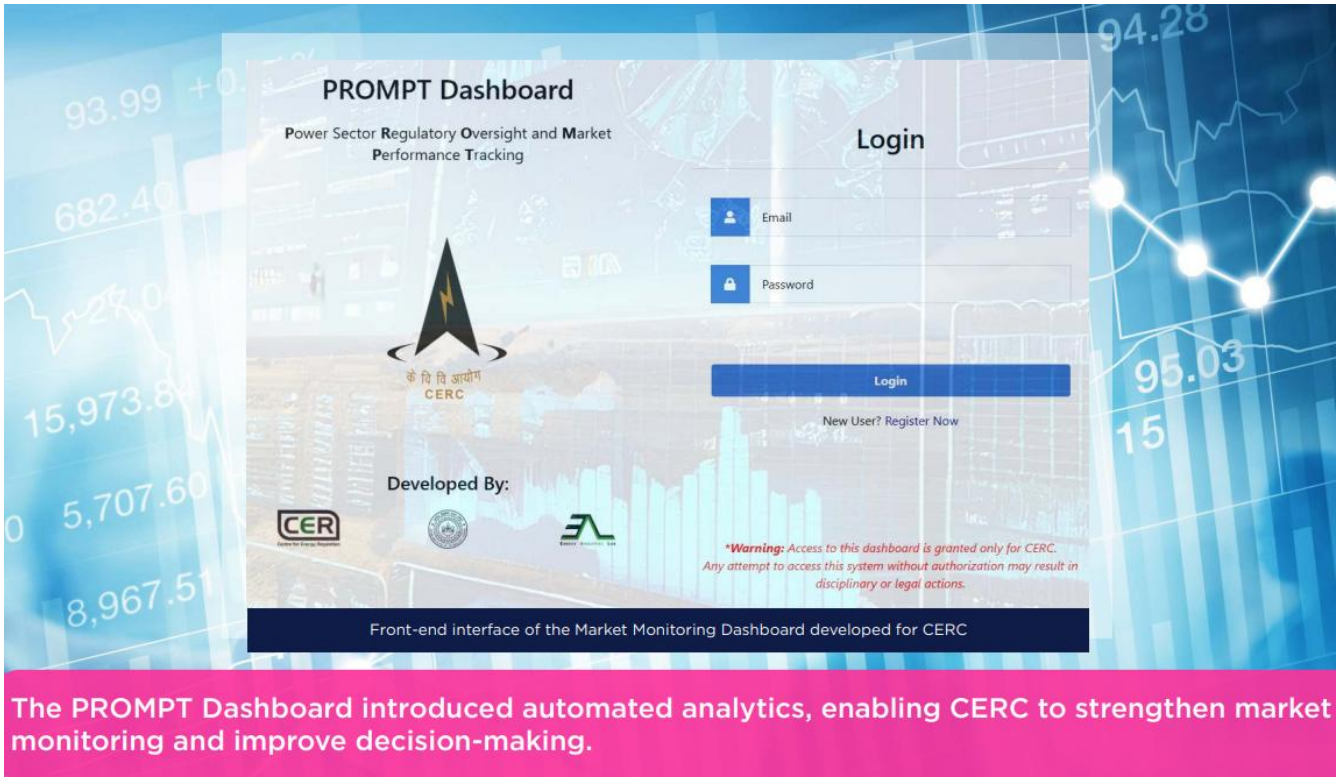
- **Renewable Energy Integration:** A comprehensive "RE Integration Study for Gujarat State in 2030" was conducted by EAL. We also explore modelling, flexibility analysis, and storage options for a more robust renewable energy integration.

- **Market Monitoring Framework for the Indian Power Sector for CERC:** A robust market monitoring framework is vital to ensure fair competition, curb manipulation, and improve transparency in India's power sector. Existing surveillance needs more sophisticated data and analytics for effective oversight. Key outcomes include a comprehensive market competitiveness framework, more granular market analysis, and guidance toward unified monitoring.



The new framework provides a structured and data-driven approach, equipping regulators with the tools necessary for effective surveillance and ensuring a competitive and transparent power market.

- **Power Sector Regulatory Oversight and Market Performance Tracking (PROMPT) Dashboard for CERC:** Effective regulatory oversight and analytics driven monitoring strengthen competitive, transparent electricity markets, deter manipulation, and deliver advanced monitoring tools, automated reporting, and secure, scalable platforms for dynamic market surveillance capabilities. We also built in-house models to provide valuable insights for power system planning and procurement.



The PROMPT Dashboard introduced automated analytics, enabling CERC to strengthen market monitoring and improve decision-making.

MoUs with Sector's Leading Entities

Central Electricity Authority

National Thermal Power Corporation

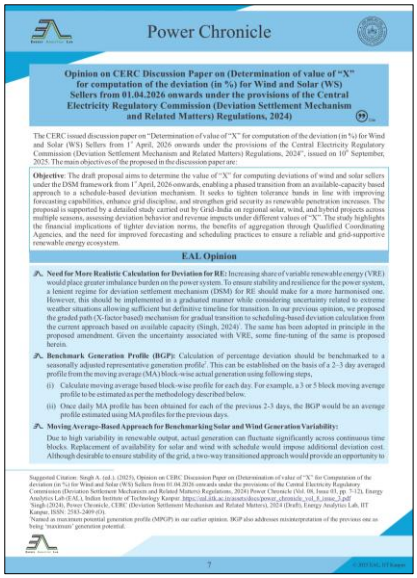
Central Electricity Regulatory Commission

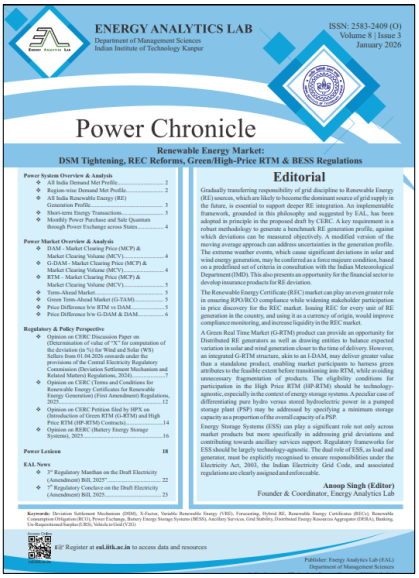
Solar Energy Corporation of India Limited

Grid-India Corporation of India Limited

Power Chronicle

EAL's Power Chronicle (ISSN: 2583-2409 (O)), brings insights into key aspects of Power Market, System Operation, Policy, and Regulatory developments in the power sector, accompanied with an analysis based on operational data. This would assist policymakers and regulators in taking appropriate initiatives to develop the Indian power market, create a conducive environment for investment, and meet the green growth aspirations for the sector.





EAL at IIT Kanpur is committed to driving innovation and excellence in the energy sector.

Through insightful research and analysis, EAL empowers informed decision-making and the development of sustainable energy solutions

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