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Oil Gas & Power.IE

25-27 October, 2021

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ENERGY TRANSITIONS WITH PROGRESSIVE DECARBONISATION OF POWER

POWER .IE 2021

25TH – 27TH OCTOBER, 2021

Other Concurrent events

Oil&GAS .IE 2021 | GAS WORLDTECH .IE 2021 | Refining & Petro CHEMICALS .IE 2021 | SURFACE ENGINEERING & Corrosion Control.IE 2021

International Integrated Energy Show in India

Jasubhai MEDIA

Chief Guest

Suresh Prabhu
Member of Parliament,
Govt of India

Hon'ble Suresh Prabhu has held various cabinet portfolios and is known for his out of box thinking and scripting various reforms and effected organizational transformations. He owned Chartered Accountancy firm before joining politics in 1996. In a short tenure of 13 days made efforts to create transparency in the functioning of the Ministry and clearance of pending works. Parliamentarian with Top Qualities of Head and Heart.

Currently a Member of Rajya Sabha from Andhra Pradesh, have been a Member of Parliament in the 11th, 12th, 13th and 14th Lok Sabha from 1996-2009.

"Fuel providers, machinery providers, Distribution companies, people who provide technologies to others, unless they actually join hands they would not be able to succeed the power sector. Unless you bring reforms in the power and energy sector which need to be comprehensive. What we really need is leadership to make sure that we all work in unison with a much shared vision of making India growing ahead which can never happen unless the futuristic energy is the backbone of the growth. Let this not be a one of event, but a beginning of a process that will make a mark in the future that can be an ongoing venture."

Special Address

Gurdeep Singh
CMD, NTPC

Shri Gurdeep Singh is a Mechanical Engineer who has more than three decades of experience in power generation sector. He started his career with NTPC Limited and has worked at various levels both in Indian and Multi-national Companies namely Powergen, CLP, IDFC, CESC and AES. He has worked in different areas of Power Sector ranging from business development, projects and operations. Prior to joining NTPC, Shri Singh was Managing Director, Gujarat State Electricity Corporation Limit.

"Unless the whole globe achieves net zero and everybody works together in synchronism it is a long shot. India has done a commendable job in the last four to five years and has been lauded across the globe. Going forward we need to accelerate the speed to meet our targets and be careful that the transaction is swiftly possible."

Keynote

KVS Baba
CMD , POSOCO

KVS Baba has varied experience in his 38 years of service. His worked in the areas of Power System Planning and Design of EHV Transmission system, Power System Studies and Analysis, Corporate Planning and Project Management in Distribution Systems in NTPC and POWERGRID. In POSOCO, he is associated with System Operation & Market Operation and worked as head of Northern Regional Load Despatch Centre & Nationals Load Despatch centres. POSOCO prepared many data intensive reports on System Operation and Market operation during his tenure.

"As an electric system operator we look AT how the consumer gets for affordable, sustainability and economically power to make it available. We are thriving to make it available and prove lot of digital solutions technically meeting the requirement. All the stakeholders must understand the paradigm shift for the availability and outdoor."

Keynote

John McKiernan
Head of Innovation Pipeline
ESB , Ireland

John McKiernan is Head of Innovation Pipeline at ESB. John is responsible for identifying new ways to collaborate with new partners in 3 key areas: new revenue, performance improvement & cost reduction. He was previously Partner at Greencoat Capital – the adviser to ESB's €200m Cleantech Investment Fund. John is a power sector investment specialist with over 20 years of international development experience including 8 years in Tokyo. John is a founding partner of FREE ELECTRONS – the global utility accelerator program & member of Ibec's Innovation, Science & Technology Policy Committee.

"Last year in 2020 we had 43.4% electricity derived from renewables in Ireland and 38% was from wind onshore which the sending highest percent in the world. Electricity is clean at the point of consumption but the challenges is to use more electricity and make it clean that's why you need to decarbonize. For the first time Ireland's electricity carbon intensity had dropped below 300 Gcoc KwH, a considerable drop from the 1990 levels, when it was three times 2020 levels at 896 gCO2/ kWh ."

FROM THE CHAIRMAN

RACING TOWARDS NET ZERO

COP 26 re-emphasised the urgency to address the climate change through energy transition which has mandated the industries to build the roadmap for carbon abatement & reducing gas emissions. Creating low carbon economy will require the stakeholders of energy industry to adopt new technologies, develop new energy resources to create the energy mix that would be best suited for our country and to build roadmap to achieve the ultimate goal to reach Net Zero. Even for the most ambitious efforts to increase the share of renewables & alternate energy resources to simultaneously meet the growing demand & reducing gas emissions, oil & gas will continue to be a part of the energy mix.

Chemtech has continued to align the goals in accordance with the emerging trends & the key objective to organise Oil Gas & Power. IE 2021 energy forum ahead of COP 26 was to accelerate the momentum created globally through the campaigns like Race to Zero at a global level & take holistic approach to enable the mid & small size players in our country to be a part of the global energy transition movement.

Through Oil Gas & Power. IE 2021, the online international integrated energy tradeshow Chemtech endeavoured to bring together the patrons of energy ecosystem from the Indian Government, up mid & downstream of Oil & Gas, Power Generation & Transmission and equipment technology & services providers and allied sectors.

My deep appreciation & gratitude to Mr. R K Srivastava, Director Exploration, ONGC, Mr. P K Goswami, Director Operations, Oil India Ltd, Mr. E S Ranganathan, Director Marketing, GAIL India Ltd, Dr. SSV Ramakumar, Director R&D and P&BD, IndianOil, Mr. U K Bhattacharya, Director Projects, NTPC Ltd & Mr. R P Pandey, ED – CES Onshore, ONGC for leading the central advisory boards and Conference Conveners, Mr. S K Moitra, Ex- Director Operations, ONGC, Mr. Rajeev Mathur, President Growth & Policy, Cairn Oil & Gas and Mr. A K Jha, Ex CMD, NTPC Ltd and Mr K L Batra, former CMD Chugoku Paints for their support to develop highly relevant conference programs that strongly resonated with the industry.

We received overwhelming response for our very first online energy trade meet. 3 days of Oil Gas & Power. IE 2021 witnessed participation of more than 4500 trade visitors who visited the virtual exhibition to digitally experience technology display by over 60 exhibitors and attended 5 technical conferences. I thank Chemtech patrons for their assiduous support towards making this event a grand success.

Best regards

Maulik Jasubhai
Chairman & Chief Executive
Jasubhai Group & Chemtech Foundation

Jasubhai MEDIA

MESSAGE FROM CHAIRMAN POWER WORLD. IE 2021

Energy Transitions with Progressive Decarbonization of Energy is a key driver to economy. It is known to all of us. However, with the industrialization in last century, energy use suddenly jumped to new heights, resulting more and more GHG, especially carbon dioxide emissions.

Higher greenhouse gas that is carbon dioxide, mainly concentration in atmosphere leads to new challenges to climate change pattern across globe. In this context, IPCC, created by the United Nations in 1988, first, came out with a report which conclusively set its agenda that climate change is anthropological that is manmade. United Nations Framework Convention on Climate Change that is UNFCC. The world community has progressed over the years to Kyoto Protocol in 1997 as well as various conference of parties known as Cops, including the landmark Paris Agreement during Cop 21 in 2015. The goal set by the world community for itself is to limit global warming, preferably to 1.5 degree Celsius compared to three industrial levels. The long term goal is to create a carbon free global economy. Decarbonizing the energy system involves replacing the fossil fuel currently being used with energy sources that emit far less carbon dioxide, and that sets the context of this conference being organized from today.

Power World. IE 2021 conference was planned and designed with the objective of bringing some of the best minds together from the industry and a great learning opportunity to all of us to reach progressive decarbonization.

We were deeply honoured to have with us the visionary Sh. Suresh Prabhu, Honourable Member of Parliament as the Chief Guest and thank him for his extensive contribution for introducing reforms & taking some of the path breaking initiatives for the Power Sector during his tenure as the Union Minister for Power.

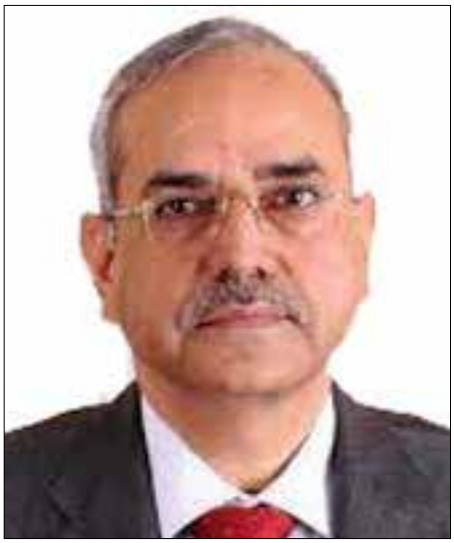
And my gratitude to the entire team of Chemtech Foundation for successful execution of the entire program which saw very impressive display of technologies in the virtual exhibition & enthusiastic participation of professionals from the energy industry.

I wish Chemtech all the success for such future endeavours.

With Regards

U K Bhattacharya
Director Projects, NTPC Ltd

FOREWORD FROM CONVENER



We won't be able to turn off the tap on climate change overnight as Carbon dioxide and other greenhouse gases, the primary cause of climate change, will remain in the atmosphere for many years, heating the earth. Lowering greenhouse gas emissions is critical for saving our Earth, the only planet we have .The ultimate objective is to restore the global climate to pre-climate change levels by rebalancing the scales. To get there, we need to cut greenhouse gas emissions to net zero and then start to work repairing the damage that has already been done by reducing historical emissions.

India has officially joined the net-zero pledge club, and its 2070 target presents a reasonable but challenging timeline for the country. The commitment was announced by Prime Minister Narendra Modi on November 1, 2021 at the COP26 UN climate conference. India has also committed some intermediate goals. India proposes by 2030, renewable energy would account for half of the country's power generation capacity.

Today India is currently the third highest-emitting country in the world but it's also home to 17% of the world's population, so in per capita emissions, it's at less than half the global average—well below other top emitters. Tens of millions of people in our country still don't have access to electricity. Moving away from coal will eventually be necessary to hit net-zero emissions, but that will present a real challenge for the country's economy, as today about 70% of our power currently comes from fossil fuels. And cleaning up other sectors besides electricity—like industry and transportation, which generate a large portion of India's emissions might require new technology interventions and innovations.

With the above perception in the background a pre-Cop 26 event Power World IE 2021 by Chemtech was organised with the theme title 'Energy Transitions for Progressive Decarbonisation of Power '. The online web event had an Inaugural Plenary session, Panel discussions and seven (7) well-structured theme sessions spanning over three days from 25th to 27th October 2021.

My special thanks to Shri Suresh Prabhu Ji who inaugurated the event and shared his vision for the sector. I am thankful to Chairman CMD Shri Gurdeep Singh ji, CMD POSOCO and all the distinguished speakers, guests, and delegates for being a part of this landmark event. I am thankful to Shri Ujjwal Bhattacharya, Director (Projects) NTPC for his motivation, guidance and timely interventions for making the event a grand Success. My special thanks to Mr Maulik Jasubhai, Chairman & Chief Executive Jasubhai Group & Chemtech Foundation for organising endeavour to bring together the stakeholders from the energy spectrum to common platform.

I along with my team from NTPC and Chemtech feel proud to be a part of this event and hope we shall continue contributing to this cause of Climate action in the coming years. I am thankful to my team from NTPC , Saroj Chelluri, Technology Strategist, Prasenjit Pal & A K Samal and team from Chemtech for their tenacity and dedication to make this event memorable.

With Regards

A K Jha

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Energy Transitions with Progressive Decarbonisation of Energy

Global Warming challenges and Environmental Sustainability have necessitated a paradigm shift in the Energy Sector like never before. A major transformation in energy systems is inevitable. Not only clean energy sources as substitute to highly polluting conventional fossil fuels need to be identified but also the requisite technologies need to be developed to make this energy available to the end users in appropriate forms and the way it is utilized. This, undoubtedly, is an uphill task but has to be dealt with determination in the coming one or two decades if the global temperature rise is to be restricted to 1.5 degrees by 2050.

Revolutionary and disruptive changes are the need of the hour and can be achieved only through collective and collaborative efforts right across the economy. The imperative needs today are dissemination of information, identification of a clear technology roadmap, seeding of R&D efforts, facilitation and incentivization of industries through policy measures. This Pre COP 26 Conference event, therefore, seeks to inspire the technology leaders, facilitate identification of pathways for decarbonization of power, and unify various stakeholders for concerted efforts. We are hopeful this will go a long way in defining the way for energy transitions and speed up the pace towards net zero emissions.

India's electricity security has improved markedly through the creation of a single national power system and major investments in thermal and renewable capacity. India's power system is currently experiencing a major shift to higher shares of variable renewable energy, which is making system integration and flexibility priority issues. The Government of India has supported greater interconnections across the country and now requires the existing coal fleet to operate more flexibly. It is also promoting affordable battery storage. International experience suggests that a diverse mix of flexibility investments is needed for the successful system integration of wind and solar PV. This flexibility is available not only from the coal fleet. The flexibility can also come from natural gas capacity, variable renewables themselves, energy storage, and demand-side response and power grids. Many of these solutions are not yet fully utilised in India. To fully activate a diverse set of flexibility options, it is critical to put in place electricity market reforms in place and also enable the appropriate price signals and create a robust regulatory framework to meet the challenge of energy transitions.

Keynote

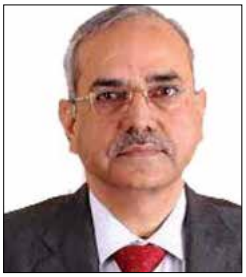
Mr. P K Pujari
Chairman
Central Electricity
Regulatory Commission

P K Pujari has handled assignments in various departments/ministries in Gujarat as well as Central Government, such as power, commercial taxes, finance and industries. He was Secretary to Government of India, Ministry of Power for more than two years before his superannuation in 2017, after serving for 36 years. He worked in the power sector for more than seven years, as Director and Secretary. As Director he was involved in developing policy framework for participation of private power utilities in generation and distribution.

"The energy sector's shift from fossil based system from energy production and consumption to energy sources like wind and solar, energy storage and batteries. The increasing penetration of renewable energy into the energy supply mix and improvement in energy storage are the key drivers in such energy transition. Such energy transition addresses the twin challenges of climate change and energy security in one go, renewable energy sources are enabling countries to move away from fossil fuels and also strengthen their energy security and achieve greater energy independence by harnessing renewable energy resources."

Energy Transition Pathways: Round Table Discussion

The energy transition is a pathway toward transformation of the energy sector from fossil-based power generation to net zero-carbon power generation by the second half of this century. The need is to reduce CO2 emissions to limit climate change. Decarbonisation of the energy sector requires urgent action by all stake holders on a global scale. The panel shall discuss on the various pathways to achieve the goal. Expert panellists from renewable energy sector, energy efficiency sector, carbon capture technology leaders, refuelling initiative leaders shall deliberate and collate for this goal of net zero in this inaugural session of round table discussions.



A K Jha
CMD, NTPC Ltd &
Convener
Power World. IE 2021

Sanjay Sharma
ED, SECI

KVS Baba
Chairman, POSOCO

V K Singh
CMD, NEEPCO

Christian Valdes Carter
Head Innovation Norway

Prasenjit Pal
GM Project
Telangana STPP, NTPC

A P Samal
AGM
Project Engineering,
NTPC

Dr Dilawar Singh
MD & CEO,
Sun Brilliance Group &
President, IBC Australia

Synopsis of Discussion

After the inaugural session a panel discussion was organised. At the beginning theme presentation "Regulatory framework to facilitate & promote Energy Transition" was delivered by Mr. P K Pujari, Chairman, Central Electricity Regulatory Commission. The presentation could set the tone for the subsequent discussions by the eminent panellists. The presentation was focused on the regulations envisaged to facilitate the energy transition in India. The panel was consisted of following eminent personalities who are well known figures in the Indian Power sector.

Prasenjit Pal, GM Projects, Telangana STPP, NTPC limited anchored the program and Mr. A.P. Samal, AGM Project Engineering, NTPC Limited moderated the panel discussion. The learned specialists expressed their views on various ensuing issues concerning the energy scenario and transition aspects. The deliberation was interactive and in the form of question answer covering following areas.

The world is under energy transition and all the countries are striving to reach the destination called Net Zero. Different countries are at different phases of this transition. It is obvious that the solution is renewable to the maximum extent, however all renewable sources comes with variability and the challenge is the grid management either by storage technology like battery, pumped hydro, gravity storage, thermal storage, green Hydrogen etc. and the conventional sources has to bridge the gap till the system is self-sufficient. It gives rise to issues like cycling cost, flexibility issues for old plants etc. E-mobility, Carbon Capture & Usage (CCU) and induction of alternate fuels like green Hydrogen, Methanol, ammonia etc also provides promising solution. India is also taking a very positive role in this regard. Be it India's INDC, Aggressive renewable addition targets supported by policy interventions. To be successful in this noble cause to protect our mother earth, co-operation and support of all stakeholders will be required. The path way followed by various countries and the additional efforts required to achieve the goal was discussed. Importance and role of storage technology and the technological intervention required, Carbon capture and energy storage in the form of green hydrogen, one world, one sun and one grid concept, Grid management technologies and policy interventions like Ancillary services, future of thermal power plants, role of Renovation and Modernisation were deliberated.

Finally the deliberation was summed up with a vote of thanks.

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SESSION I

Carbon Capture & Usage Carbon capture, Utilisation & Storage (CCUS)

Carbon Capture & Usage Carbon capture, utilisation and storage, or CCUS, is a vital emissions reduction technology that can be applied across the energy system to immortalise fossil fuel fired power plants. CCUS technologies involve the capture of carbon dioxide (CO2) from fuel combustion or any other industrial processes and then it is transported and used as a resource to create valuable products like hydrogen, methanol, and create a circular economy. CCUS technologies shall play an important role in supporting clean energy transitions in India as here we have about 200 GW coal fired power plants and a large coal resources and mining infrastructure. Repurposing Coal plants by capturing CO2 and converting to useful resources is one of the major energy transition pathways. While the prospects for CCUS goes beyond fossil fuel applications, the technology can be an important pillar for facilitating India transition from its current energy mix to one that is aligned with future climate goals.

Keynote & Session Chair

Derek M Shah
Executive Vice President &
Head – Power IC & Green
Manufacturing & Integrated
Development, Larsen & Toubro

Derek M. Shah is the Head of Power Business, a vertical of L&T which deals with the complete spectrum of EPC of Thermal Power Plants. He is also Head of Green Manufacturing and Integrated Development, a new Business Unit which has been created to cater to the green energy sector across the entire value chain from manufacturing of PV Solar Cells and Panels, Advanced Technology Batteries, Hydrogen Electrolysers and Fuel cells.

He had joined L&T in 1986 as a Graduate Engineer Trainee. In the last three and half decades, he has worked in various functions in company addressing the Industrial Project Space and as IC Head of both MMH and Power has been instrumental in partnering Global Technologists to secure and execute large orders, both domestic and international.

"CCUS will need to form a key pillar to put the world on path to net zero emissions. A net zero energy system requires a profound transformation in how we produce & use energy that can only be achieved with a broad suite of technologies. Alongside renewables, hydrogen & sustainable bio energy, CCUS will need to play a major role towards decarbonization. It is the only group of technologies that contributes to both reducing emissions from the key sectors directly and to remove CO2 to balance emissions that cannot be avoided, a critical part to net zero goals."

Converting waste CO_2 into commercially viable carbon

Gay Wyn E. Quance
CEO, Solid Carbon Products LLC

Gay Wyn is the controlling owner of SCP. She and her late husband, Dallas B. Noyes, founded SCP in 2009. She has led a career at the leading edge of energy and business. With a background in chemistry and geology, she spent 15 years as a commissioning and reliability engineer at nuclear power plants, before leading rapid application development and professional software services in the ecommerce, nuclear, and smart grid sectors. She has spoken widely about the promise of CO_2 utilization to solve some of the most pressing problems facing us today.

"It is very important for India to attain sustainability and also have security in energy as well. Hydrogen is something that is 70% of the energy source in the world and has been used in refinery for many years to get sulphur and to take it out in final products. This is grey hydrogen which has been increasing as per the demand for regulators to reduce sulphur in products. Industries need to adapt in the next years to be aligned with new regulation and demand for consumers. Production will also be key points, how industry is sourced with timing for investments, source of financing, government providing incentives that should be upgraded and updated."

MHI's CO2 Capture Technology

Takashi Kamijo
Chief Engineering Manager of Decarbonization, Mitsubishi Heavy Industries Engineering

Takashi Kamijo has over 25 years of experience in Engineering and Project Management of Carbon Capture technology of MHI Engineering. He is the Project Manager and Chief engineering manager for various CO2 project including largest CO2 capture plant in the world of 4,776 tons per day at Petro Nova, USA which was executed by MHI Engineering on turnkey basis. He is currently involved in engineering & project management of carbon capture overseas projects, and new technology development for CO2 capture process technology.

In his presentation, he will cover MHI Engineering's CO2 Capture technology, Plant experiences and various usages of captured CO2.

"Our CO2 capture technology is called the "KM CDR Process", which stands for Kansai Mitsubishi Carbon Dioxide Recovery Process. We started developing this technology in 1990 jointly with Kansai Electric Power Company, second largest utility companies in Japan. A feature of the KM CDR process is that its use of proprietary amine solvents and equipment. Users enjoy low energy consumption, low corrosiveness, low solvent degradation and high reliability. KM CDR has been used in various flue gases such as gas and coal and in various CCUS applications."

Mineralisation: Nature's final resting place of CO2

Dr Gaurav A Bhaduri
IIT Jammu

Dr Gaurav Ashok Bhaduri, did his BE (Chemical) from Pune University in 2010 and a PhD from Newcastle University, UK in 2015. He has worked at various positions in organisations worldwide which include, National Chemical Laboratory Pune; Newcastle University UK; Northumbria University UK; Shanghai Jio Tong University PR China; Indian Institute of Technology Kharagpur and Manipal University Jaipur.

He has also been active in setting up the Department of Bioscience and Bioengineering at Indian Institute of Technology Jammu. His research interests include, Carbon Capture and Storage, Process Intensification, Environmental Engineering, Bioprocess and Bioengineering, Nanomaterials.

"Mineralisation as a process for CO2 sequestration. The different steps for CO2 minealisation depending on the process used. Aqueous CO2 mineralization. Hydration of CO2 and its catalysis using Nickel Nanoparticles. NiNP Catalytic Mineralistion of CO2 in slurry and tubular reactor."

CO2 utilization via reforming and hydrogenation

Dr Raja Ram Bal
CSIR-IIP Dehradun

Dr Raja Ram Bal, CSIR-IIPs is almost 25 years of research experience, published more than 130 papers in international peer reviewed journals. He completed his M.Sc. from IIT Kharagpur, 1996 and Ph.D. from CSIR-National Chemical Laboratory, Pune 2002. Almost 5 years of Postdoc experience as an Alexander von Humboldt Fellow at University of Bayreuth Germay (2002 -2003) JSPS Fellow at the University of Tokyo, Japan (2003 to 2006), Joined as a Scientist since December 2006 at CSIR-IIP, Dehradun.

Presently working on development of nanostructured catalysts for methane activation, selective oxidation, CO2 to chemicals & fuels, biomass to chemicals, water-gas-shift reaction. He has supervised 7 Ph.D. students and supervising 9 Ph.D students.

"Catalytic activity of a catalyst is a combined effect of surface area of the catalyst, support property, active metal property, active metal dispersion, active metal size and metal-support interactions. Any one of it alone cannot determine the catalytic activity of a catalyst. Controlled deposition of active metal particles creates better metal support interaction with smaller active particles. Synthesis gas with different H2 /CO ratio can be produced by reforming of CO2 where CO2 conversion is > 95% and the catalyst is also very stable."

"Putting the U in CCUS" Case Study for conversion of CO2 to Methanol and Carbonates

Manikandan Narayanan
Head of Business & Technologies (APAC),
Technip Energies,
Malaysia

Manikandan Narayanan is a chemical engineer and a registered Chartered Engineer (UK). He has 30 years of experience practicing in the design and engineering, commissioning, start-up and technical services of LNG, refining, ethylene, aromatics, and captive power plant projects ranging from concept studies, front-end engineering and detailed engineering, costing, commissioning & start-up.

In his current position he is responsible to lead business and project development for technology driven projects in Energy Transition, Hydrogen, CO2 Management, LNG, refining and petrochemicals.

"Technip Energies is a global leader in the hydrocarbon business, with extensive expertise built from six decades of project execution with a strong global team of technology experts. Ambition to accelerate the Energy Transition across the downstream industries. Actively involved in conversion of CO2 to Sodium bicarbonate. Capacity to anticipate and optimize integration aspects at early stage."

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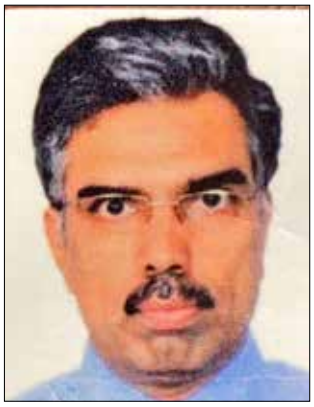
SESSION II

Renewables: To Reach Net Zero

The rapid growth of solar and wind power in recent years has breathed hope into efforts to reduce greenhouse gas emissions and win the race to Net Zero. The fast growth of renewable energy over recent years offers us a stronger chance of producing green power. In the coming decade the Indian power system is due to undergo a profound transformation. The government plans to increase renewable generating capacity from 175 GW in 2022 to 450 GW in 2030 which shall amount to more than 50 % of the generation capacity in 2030. The cost of renewable energy continues to fall and, in most cases, it's now cheaper to use renewables than fossil fuels.



Sanjay Sharma
ED, SECI

Keynote & Session Chair

Joined L&T-ECC Group HQ, in July-1988 after completing B.Tech. Then EMKAY structures, Ghaziabad before joining Powergrid Corporation of India Limited. In SECI, headed Contracts division, Solar Division and Wind division simultaneously in the past. Now, looking after implementation of all projects related to solar, new emerging technologies like green Hydrogen and others. Received personal commendation, titled "Certificate of Recognition" for services in the development of renewable sector in India through transparent and investor friendly competitive process from Movement des Enterprises des France (MEDEF) International, Paris (French Business Confederation), ceremony hosted in Paris.

"Renewable energy is fastest growing source in India. India's renewable energy is the 4th most attractive renewable market in the world. India aims to install 450 GIGA volts energy capacity by 2030. Large hydrogen is included in installed RE capacity to achieve 146 GIGA volt Plus. The new energy economy will be more efficient, interconnected and clean. In most market Solar PV or wind now represents the cheapest available source of new electricity. There are certain challenges in renewable energy like Intermittency, variability, grid integration, highly considerable impact geo political conditions like variation in Module pricing, changing though and others."

Sujoy Ghosh
VP First Solar

Recyclable sustainable solar panels

Sujoy Ghosh is the Vice President for First Solar, managing manufacturing to business development. He joined First Solar in 2012, and has supervised development of utility scale solar assets (2014-18), to operationalizing a fully integrated 3.3GW/annum manufacturing facility in India, that was announced in 2021 to serve the needs of the India market.

He also oversaw First Solar's region operations in the Middle East and more recently in Asia Pacific. Sujoy has over 30 years of industry experience in India and since last 5 years, he led GE's Thermal Products and Renewable Sales in India/Sri Lanka and Bangladesh.

"Promoting high-value recycling is crucial to managing large future PV waste volumes. Recycling is important for all PV technologies. High-value recycling provides major socio-economic and environmental benefits. Ensuring the recyclability of our products is integral to our R&D process. Increased volumes of solar modules at end-of-life and greater experience in recycling, accompanied by rising disposal costs, will likely lead to recycling becoming more commercially attractive and result in higher volumes of collection and recycling."

Deepak Khare
COO, Engie

Wind Energy: Sustainable and Affordable Energy Source

Deepak is the COO at Engie India, for wind development, implementation & operations. He is passionate in leading India's Energy Transition, playing lead roles for 24 years plus in greenfield utility scale power generation projects. In last 10 years, 3 GW + developed Renewable (both Solar PV & Wind).

During first 14 years, instrumental in 10 GW+ Thermal (coal based) development projects across PAN India , as EPCC and Developer and contributed at large Power sector Indian MNCs/IPP/ EPC conglomerates, Welspun Renewables, Reliance Energy, Jindal Power & Hindalco (Renusagar Power).

"India is running the world's largest clean energy program to achieve 175 GW of renewable capacity, including 60GW of Wind and 100GW of solar power by 2022. It also has challenges like high Wind CAPEX/MW compared with conventional generation sources. Wind Energy also has challenges like high Wind CAPEX/MW compared to conventional generation sources. On shore wind Turbines in the 5-6 MW+ range introduced by GE , Nordex (Germany) , Siemens Gamesa and Vestas , and Mingyang launched 6.25 MW Machine."

Remesh Kumar
Director , ISA

Solar driven Energy transition - A path to Net Zero emissions

Remesh Kumar is the Additional Director (Programme & Projects), International Solar Alliance with more than 33 years of experience.

He joined NTPC in 1988 as Engineering Executive Trainee and worked in Project construction in Farakka, Panipat, etc and various capacities like Thermal Power Plant Planning, Monitoring, Construction, Commissioning Maintenance.

Joined Solar Energy Corporation of India (SECI), New Delhi, as General Manager (Technical), successfully implemented 750 MW VGF scheme, 2000 MW scheme of Government of India and projects like Solar Parks, Rooftop Solar Programme, hybrid Projects of Solar, Wind, and large capacity Battery storage with World Bank support. He is presently heading the Solar Park programme Unit for implementation of large-scale projects in member countries.

"ISA's Scaling Solar Rooftop programme promotes, assess potential, harmonize demand and pool resources for rapid deployment and scaling up of Rooftop Solar (Off-Grid and Grid-Connected) in ISA Countries. Solar Projects/Parks to be set up on BOO/ BOOT model by IPPs with long term PPA signed with Utility. ISA approach of Cluster based development of Solar Park/Projects is to develop solar projects in a cluster of countries and share solar power using the regional or Inter-country transmission infrastructure already available or is under development."

Converting Post Consumer Plastics Into Fuel Oil / Electricity

S Sampath
CEO, Samkitech Resources

S. Sampath, has more than 39 years of experience in Engineering Projects and about 17 years of exclusive experience in Plastics, packaging, recycling and Waste Management. 13 years tenure in Bharat Petroleum Corporation limited (BPCL) in Engineering & projects.

Chairman- Southern Chapter- National Solid Waste Association of India.

Managing Director in Pyrogreen Energy Private Limited Projects and Activities. Worked on the technology for converting plastics to Fuel promoting technologies for Municipal waste segregation, Bio-methanation, Waste to Energy, E-Waste recycling, Rapid composting etc. Offer MSW segregation Line from BMH Finland, Power plant from SFA, Swiss, Biogas plant from AAT Austria 7. He recently developed a technology to compost Organic waste into Compost in a Vesse.

> “Pyrolysis is a process of thermal degradation in the absence of oxygen with the help of CATALYST. India generates 9 million tons of Plastics waste a year about 5 million tons are recycled. If Balance 4 million tons are BURNT in Cement kiln, No money comes to GDP nor advantage passed on to cement consumers. Whereas if 4 million tons is converted into oil through Pyrolysis, 1.6 million tons of Fossil fuel is saved every year.”

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SESSION III

Alternate Fuels

Reaching NetZero emissions will require low emission fuels or the green fuels. Low cost innovative technologies for production of liquid biofuels, hydrogen-based fuels, low carbon gases (bio methane, synthetic methane and hydrogen) shall be the future pathway for energy transitions.

Keynote & Session Chair

Prasanna Kumar
Managing Director,
Gujarat State Electricity
Corporation

Shri M. Prasanna Kumar is a gold medallist in Mechanical Engineering and also an MBA in Operations Management, Marketing Management, Financial Management and Human Resources Management. Shri Prasanna Kumar is also appointed as Chairman of the prestigious WRPC (Western Region Power Committee) and Bureau of Energy Efficiency, GOI certified Energy auditor and topper of IPMA level D certified associate examination.

He was previously the Executive Director in NTPC Ltd Corporate Centre at Delhi and has published number of technical and managerial papers in conferences worldwide. He is winner of The Institution of Engineers (India) best technical journal award in 2009, NTPC management journal HORIZON best article award for the year 2012 and best Energy proposal award.

"In the 20th century the basic necessities has changed from food and cloth to Data and electricity. These basic necessities are connected with the energy. The energy generation is connected with fuel. After seeing the ill effects of carbon base fuel on environment over the last two decades, there is a need to go for alternative fuel which are not carbon based."

Amar Singh
Chief General Manager,
Siemens

Large Scale Production of Green Hydrogen - PEM Electrolyser Flexible, efficient and scalable

Amar Singh has around two decades of experience in power utility sector and experience in engineering, sales and business development. Leading business development of green hydrogen based solutions in India. He is a Mechanical Engineer, Executive Management from European School of Management and Technology, Berlin.

"Sector Coupling is the key lever for decarbonization of all end-user sectors. Proton Exchange Membrane (PEM) electrolyzer system is the natural choice for our future renewable energy system. Silyzer 300 – Full Module Array The next paradigm in PEM electrolysis. Cost-optimized and pre-engineered solutions for Silyzer 300 – can be multiplied up to Gigawatt-scale solutions. Silyzer 300 promises featires like High performance, High availability, Flexible operation, Digitally enabled and Maintenance friendly."

Saurabh Jajoo
AGM - Marketing
Mitsubishi Power India
Private Limited.

Ammonia & Hydrogen as alternate fuels for Gas turbines

Saurabh Jajoo is working as AGM Marketing in Mitsubishi Power India Private Limited. He has more than sixteen years of marketing and sales experience in power domain and allied industries. Saurabh holds an MBA from NITIE Mumbai, and has done his Mechanical Engineering from VNIT, Nagpur.

"To achieve the decarburization we have to decarbonize thermal power which can reduce CO2, Also need to focus on higher efficiency in industrial energy & should support Carbon Recycling and adopted hydrogen value chain to achieve carbon neutrality world in 2050. We at Mitsubishi are working on ammonia/ biomass co-combustion boiler to reduce 20% carbon at least. Using JAC type High efficiency gas turbine to reduce Carbon. We are also into the advanced clean energy storage project, this is the world largest renewable energy storage project. Which was launched by Mitsubishi Power, Magnum Development & the Governor of Utah in 2019. "

Prasath Chandrasekaran
Senior Manager- Plant Engineering - Mitsubishi Power India Private Limited

Prasath Chandrasekaran is currently working as a Senior Manager, Plant Engineering in Mitsubishi Power India Private Limited. Has more than 15 years of experience in Application Engineering, Tendering and Business development activities in Power sector for COGEN, CCPP, and Geothermal, applications. Has done Mechanical engineering from ESEC, Erode one of the affiliated colleges under ANNA University.

"Through the 'JAC Gas Turbine' we have achieved 64% CC efficiency and we have track record of 99.5% of reliability. We can use Gas Turbine by both the fuels i.e. fossil & clean hydrogen. For the middle range we have Gas turbine 'H-100', it has 50Hz & 116 Mega volts, and on the smaller side we have 'H-25' Gas Turbine, it has 41 Mega volts and same can be used by both fuels. We have 3 types of combustion i.e. diffusion, Pre – Mix (DLN) & Multi Cluster (DLN). Diffusion is one of the standard combustion where we can find 100% hydrogen, which we are using one of our project in Magnum, Netherland."

Sunil Singhal
Fellow Process & Research
Fluor

Coal Gasification to Achieve Energy Self-Reliance and Reduce Carbon Footprints in India

Sunil Singhal has over 18 years of industry experience. He has a bachelor's degree in Chemical Engineering from Indian Institute of Technology (IIT), Delhi, India.

His experience ranges in gasification, syngas applications, steam reforming, energy transition, water electrolysis, carbon capture, utilization and sequestration, renewables, green/blue hydrogen, ammonia, methanol, fertilizer and chemical industries, etc. He has published over 22 papers in various prestigious journals and conferences in India and abroad and has successfully led several gasification projects including conceptual studies, licensor evaluation and selection, detailed feasibility studies, basic and detailed engineering.

"The Indian coal fleet emitted 1.1 GtCO2 in 2019 and contributes to poor air quality, due to emissions of SOx, NOx and particulate matter, with associated impacts on health, ecology and economy. Gasification is a complex and challenging process but Gasification offers alternate to use domestically available vast coal reserves to make value added products in an environment friendly manner. Syngas cost of production is more economical than imported LNG in India."

Waste to Energy

V K Rakesh Reddy
MD
Hydroxy Systems Pvt Ltd

V.K. Rakesh Reddy is a journalist who has worked for prestigious media houses in the country and abroad besides being a consulting advocate by passion. M/s Hydroxy Systems is a research based company working on several ground breaking technologies in the waste to energy, aqua culture and electrical storage sectors with a few of its products already in the market while some are at the go-to-market stage and further few in the research domain.

"Waste to energy today connotes incineration/combustion in some form. Hydroxy systems technology can generate 500 – 950 litres of diesel / tonne of plastic waste. Combining plastic waste to energy plants is grossly inefficient way of realizing value, energy wise, economically and environmentally. But fuel produced through hydroxy's patent pending process has a very small carbon footprint. Plastic waste to fuel requires just 1 KWH of power and very small carbon foot print comparatively."

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SESSION IV

Energy Storage

Large storages can help keep power grids stable, when considerable amount of power is produced intermittently from clean energy sources such as solar and wind. India has crossed 100 gigawatts (GW) of installed solar and wind capacity, with another 63GW under construction. The plan is to have 175GWrenewable energy capacity by 2022 and 450GW by 2030. This huge injection of electricity in the grid from sources such as solar and wind requires a storage mechanism that can help balance the national electricity grid. Other technologies of storage like pumped storage have a large potential to use cheap green power during off-peak hours. Today the need is to focus on regulatory, financial, demand management and technological aspects in order to speed up the implementation of storage capacity driven by the need to have increased flexibility in Indian power system

Keynote & Session Chair

R.K. Vishnoi
CMD & Addl. Charge
Director (Technical),
THDC India Limited

Sh. Rajeev Kumar Vishnoi is a Hons. Graduate in Civil Engineering from BITS Pilani and an MBA and has more than 34 years of experience in the Design, Engineering and Construction of hydro project.

His work projects include Tehri Hydro Power Complex (2400 MW) comprising Tehri HPP (1000MW), Tehri PSP (1000MW) and Koteshwar HEP (400 MW), Dhukwan SHEP (24 MW), THDCIL Wind and Solar power projects.

He has significantly contributed as a member of the World Bank Expert and currently representing India in International Commission on Large Dams for the Technical Committee on Seismic Safety of Dams and integral part of formulating landmark policies of Hydro Sector of Govt. of India for Hydro.

"As we know that today we have almost ¼ of the storage of the global capacity of grid that is coming from the sources like wind, solar. The way we are expanding in the field of global energy is the time that we need to start on policy chamber to promote tvarious high end technologies. For the purpose that we are trying to study the pattern for renewable power and the difficulties that we face. We are also studying the future demand of our country and future plan. We are almost ready to prepare plan for the future."

Electrochemical Energy Storage System for Stationary Applications

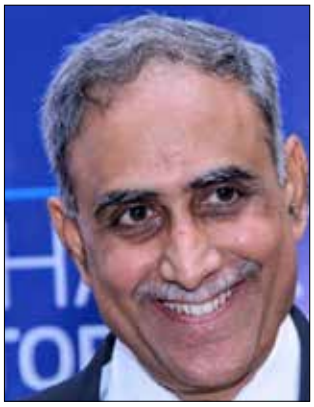
Dr Dipak Sen Chaudhuri
President-R&D,
Exide India Ltd

Dr Dipak Sen Chaudhuri, has a PhD in Chemical engineering from IIT Kharagpur and has been associated with the 'energy storage industry' for more than 40 years.

Initial training started with the then 'Chloride Group', Manchester, UK. Associated with the group in developing various motive power batteries, including those for the propulsion of 'Submarines' used today by Indian Navy amongst others worldwide, worked in close cooperation with specialists from the erstwhile Shin Kobe Battery – a part of the Hitachi Group, Japan and R&D teams of East Penn Manufacturing, USA.

A regular contributor to the quarterly journal on 'Battery & Energy Storage' - BEST magazine published from UK.

"Advanced lead acid batteries combine the high energy density of a battery and the high specific power of a super-capacitor in a single low-cost device. The primary goals are to extend the cycle lives of lead-acid batteries and increase their power. Flow batteries has strengths like flexible layout, long cycle life, and quick response time."



Prakash BVS
MD, Bharat Energy
Storage Technology Pvt Ltd

A Circular Economy Company A product with zero wastage and 100% materials good for reuse

B.V.S. Prakash holds graduate degrees in Commerce & law from Osmania University, Hyderabad, India and a fellow Member of the Institute of Chartered Accountants of India 1984. He has six years in profession, specialising in finance and audit, managing IPOs for start-up corporate. Has handled 21 Corporate clients all the way to IPOs.

Working in the area of Corporate Social Responsibility and mentoring after 2004, took interest in renewable energy and conceptualised and designed Solar Powered Computer Labs and installed them in seven schools in Hyderabad. Co-founded Bharat Energy Storage Technology Pvt Ltd, Visakhapatnam, India and is the Managing Director of the company.

> "USP is one of the Best Thermal Cell Technology. It is a Physics based technology storing energy in phase change materials where no deterioration in quality of materials occurs giving it a very long life – no limitation by life cycles. High Energy Density – 20 MwH can be stored in a 40 foot container."

Asif Hussain
Sr. Vice President,
Sumitomo SHI FW

Liquid Air Energy Storage

Asif Hussain is the Senior Vice President, Strategic Business Development for the Africa and the Indian Subcontinent. He has over 27 years of extensive experience in the power industry/ markets and has expertise in strategy, business development and growth for Sumitomo SHI FW products and services. He has previously worked for Foster Wheeler (FW) and Babcock Power in roles as field service engineer, project engineering, sales & marketing, etc. He holds a Bachelor Degree in Mechanical Engineering from the University of Maryland, management certificate from Ross Business School, University of Michigan.

"Liquid Air offers many benefits & Offers Giga-Watt Scale ES solutions for India. The Pillars of AC Transmission are Active Power, Reactive Power, Inertia and Short Circuit Power. Energy Storage Plant economics depends on value of services provided to support grid systems. Liquid Air Storage System consists of three main components, Charge, Energy Store and Discharge."

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SESSION V

Grid Transitions

Increasing integration of power from decentralised renewable sources with multidirectional energy flows, poses challenges to power grids. Despite all these dynamic factors, energy systems need to maintain grid stability, ensure power quality, enable sector coupling, deal with flexible operations, and reduce costs. Energy intelligence is the new mantra for a more adaptable and sustainable power grid. Making grids smarter with energy intelligence creates new opportunities in a changing ecosystem. Smart grids use digital technologies and IoT solutions to intelligently respond and adapt to changes in the grid. Bringing energy intelligence to the grid not only helps to mitigate these challenges, but also provides new opportunities to increase asset visibility and cybersecurity, efficiently balance generation and demand, and create new revenue streams. The Energy transition towards a decentralized, distributed, and decarbonized grid is another pathway for our race to net zero.

Dr Nagaraj
MD , Power Research & Development Centre (PRDC)

Keynote & Session Chair

"To get insight into grid transition in 2015 only India has set the goal of generating 175 GW of renewable energy by 2022. There are lot of major initiatives taken to achieve RE integration which include deployment of pump storage and grid connected balancing sources, enabling of secondary reserves like automatic generation control (AGC) that have been implemented successfully in few pilot projects and utilization of renewable energy management systems to control the renewable energy as per grid requirements. At the planning front as part of GTG project deployment of countrywide integrated resource mapping tools like, demand forecasting generation adequacy & optimisation."

Dr. R. Nagaraja completed his Bachelors in Electrical and Electronics Engineering from Mysore University and obtained his Master's degree from Indian Institute of Science (IISc.), Bangalore, specialized in Computer Applications to Power Systems and Drives.

Dr. Nagaraja was awarded Doctorate for his work titled "Development of algorithm for applications in energy control centers," M/s. Power Research & Development Consultants Pvt. Ltd. at Bangalore in 1994. His specializations include Parallel Computing, Power System Analysis, Simulation, SCADA Systems and Energy Management Systems, Development of Algorithms for Real-Time Power System Simulation and Control, Power Engineering Education and Power System Protection.

A B Rathod
Addl. Chief Engineer(SLDC),
GETCO

Energy Transitions with Progressive Decarbonisation of Power

A B Rathod has proven experience in project planning, estimating, costing and executing of HVAC system for 400kV, 220kV, 132kV, 66kV & 11kV Sub Station & Transmission lines and control systems. Implementation and execution of EHVAC Projects, company : Gujarat Energy Transmission Corporation Limited, Bharuch, Implementation and execution of EHVAC Projects, Erection of EHV Transmission lines and Sub Station, Transmission Division, Anjar, Kutch and 220kV Bhilad Sub Station.

"Need of the time leads Grid Transition which is an integral need of the time aims power for All, Improve Reliability of Supply, Improve Quality of Supply, User friendly and transparent interface with utilities. It promises end results of satisfied customers, financially sound utilities, tariff neutral system upgrade and moderation. Synchrophasor technology is replacing the SCADA, which has high sample rates of 25-50 samples per second."

Philippe Lienhart
Strategy, Innovation and New Business Manager, EDF Energy

Energy Transition with Progressive Decarbonisation of Power

Philippe Lienhart has over 39 years in electrical power System, Transmission and is an Engineer graduate of French Ecole Centrale and MBA. He was the Team Leader of Northeast Asia Power System Interconnection (NAPSI) and involved in Greater Mekong Subregion Interconnection and is now working on the "One Sun One World One Grid" interconnection (OSOWOG) as Team Leader for the International Solar Alliance.

Lienhart is a Fellow Expert for EDF Group, the CIGRE coordinator for EDF Group and Member of Technical Committee of VGB PowerTech and Senior Member of SEE.

"Interconnection is globally progressing at regional levels and Decarbonation, electrical markets and Interconnections are related. The goals of flexibility to handle variability, interconnections are connecting RES and load, keeping the lights on and balancing the economics."

Ravi Kuchi
Regional Head -Business Development for South, East & North East Regions, India Energy Exchange

New Energy Exchange Models: Affordable energy supplies - flexible tariffs

Ravi Kuchi is Regional head -Business Development for south, east & north east regions in IEX. He has more than 15 years of experience across the value chain of the power sector- as a power system planner in the Central Transmission Utility (POWERGRID), as a power sector consultant in two Big 4 firms (PwC & EY) and most recently with an RE developer (Sembcorp).

"IEX completes 13 years of successful operations. Endeavors to support a sustainable energy economy. Diversified Open Access has pioneered operationalisation of open access since inception and today holds a strong and diversified open access participant base of 4500+. At present around 1300 clients are actively trading on IEX."

Ashish Kulkarni
Sales Director & LPG Manager – Power Generation & Water
ABB Solution

ABB AbilityTM Flexibilisation

Ashish Kulkarni is a top-performing sales director with 29+ years' experience out of which 22+ years in ABB, currently developing new business in the field of Power Generation & Water segment Automation. Wide Experience in ABB from Products to System solutions across both Power Segment and Industrial Automation segment perspective including account management.

"The Power Generation business has evolved from a few well controlled generating units to a myriad of distributed, autonomous generators and loads. The key challenges faced by steam power plant customers is Reduced power prices & dispatch, Reliability & Availability due to cycling and Transitioning workforce."

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SESSION VI

Disruptive Technologies for Sustainability

Today many new disruptive technologies have changed the outlook and facet of society. These technologies can cause significant greenhouse gas reductions and other benefits in terms of logistics and smart cities. Disruptive Technologies and eco-Innovation for sustainable development shall provide an in-depth look into the new techniques, strategies, and technologies for achieving environmental sustainability through best business and technology practices. Conserving water, reducing energy use, and eliminating solid waste can improve the environment, save money, and help communities become more sustainable and resilient and bring us closer to Net Zero targets.

Dr Ravi Segal
Ex- Business Leader, GE
Energy Consulting

Keynote & Session Chair

Dr. Ravi Segal retired after 24 years of engagement with GE as Business Leader – South Asia, ASEAN, China of Energy Consulting group and worked for BHEL for 12 years as a technical specialist for installation, testing, commissioning & troubleshooting of excitation and speed control systems.

He has been focusing on power system planning and grid interconnection studies and frequently serves as a consultant to the power system planners, system operators for policy recommendations on generation & transmission planning, grid codes and tariff norms for various technologies.

He has PhD in Power Systems from IIT Delhi and has over 30 publications.

"Power grid has transformed significantly over the last few decades and we have witnessed large scale renewable penetration, adoption of energy storage technologies and creation of large power pools across states in India but also spread across several countries. There is tremendous focus on as well towards moving towards better grid discipline. The reality is that power market has matured enough and ready to adopt new technologies primarily for energy security but again there are several factors that are deciding factors like ensuring high stability, reliability safety & efficiency of the network."

Binang Gamit
Project Manager Generation Engineering , ESB

Leading Energy Transition with Free Electrons

Binang Gamit is a Flexible Technology Project Director at ESB and the technical team leader of the creators of the world's first physics based Digital Twin of the Turlough Hill Hydro Power Plant. Binang has been highly motivated about developing a sustainable environment and has performed various academic thesis and professional projects related to renewable energy development and energy efficiency enhancement of large scale equipment.

"ESB took decision to re-enginener the mountain of Turlough hill to bring to life cheaper reliable source of energy available in Ireland. Hydro power plant situated between 2 lakes separated by altitude of approximately 200 m had huge asset management challenges. 4 turbines generate 292 MW of electricity. Overall this is quite a crucial power station that should be sustained for decarbonization & low energy future. ESB partnered with Akselos Workflow for the digital twining technology to realise possibility of optimising huge scale structures and created world's first physics based digital twin for pump storage hydro turbine."

Vivek Pandey
GM , NLDC

Implementation of other solutions - forecasting, technical minimum, capacity building essential for real transition

Vivek Pandey is an electrical engineering graduate from Visvesvaraya National Institute of Technology, Nagpur and did his MBA from IIT-Delhi. He has over two decades of experience in power system operation, electricity market operation and regulatory affairs in India.

Has been closely involved in implementation of deviation settlement mechanism, congestion management, open access, Point of Connection transmission tariff, reliability coordination, interstate energy scheduling & metering, among many others. Pandey is a Fellow of Institution of Engineers India, Senior member IEEE-USA and Distinguished member of CIGRE-France and has over 40 published papers nationally and globally.

> “Few of the key elements to facilitate energy transition are Lower turn down level of thermal generation fleet, better tools for demand and RE forecast, dimensioning of reserves and mechanism to despatch them and capacity building to institutionalize flexibility. Lower turn down levels is particularly required in generating stations with high Energy charge rate.”

Pankaj Gupta
AGM PE Mechanical
NTPC LTD

New Environmental Norm- Implementation status and Challenges

Pankaj Kumar Gupta is working as an Additional General Manager in the

Project Engineering -Mechanical Division of NTPC and graduated in Mechanical Engineering from IET Lucknow completed M Tech from I.I.T Delhi. He has more

than 29 years' experience in thermal power plants in the area of engineering and Operation & maintenance of Steam Generator, Engineering and design of

subcritical and supercritical Steam generator, Electrostatic Precipitator

(ESP) and other Environmental systems. He has played a key role in planning

and implementation strategies of FGD and De-NOx system in NTPC and

SCR/SNCR pilots tests.

> "Considering the practicality of Implementation of norm, a detailed phasing plan upto 2024 was prepared by CEA with was squeezed upto 2022. Factors impacting FGD Cost are size of the unit and configuration, numbers of units, layout constraint. Challenges in Implementation is changing due to various guidelines like manpower mobilization issues due to Covid-19, limited civil & chimney vendors, equipment/material supply impact due to COVID-19, testing and inspection."

Venkatesh Rao
Air Quality Control Systems (AQCS) India Product Line Leader , GE Steam Power

FGD & Emissions control

Venkatesh Rao has more than 19 years of experience in AQCS in Power and Industrial applications. He has worked in Tendering, Global Product Management, International Sales & Marketing, etc. Has co-authored papers in the field of particulate control and presented in key Power and Industry conferences across Asia, Middle East and Africa.

"Some FGD Technologies for India are Open Spray Tower and NID. Some of its salient features are Performance Enhancement Plates, Spray Banks, Tray Design. FGHRS for Water Consumption Reduction has some major Components like Heat Exchanger & associated systems, Condensate Booster pumps - Interconnecting Piping, Valves & installations."

Smart Metering

Murali Shankar Gopalakrishnan
Vice President – Solutions &
Product Engineering,
Fluentgrid Ltd.

Murali Shankar Gopalakrishnan, represents Fluentgrid in the capacity of Vice President for Solutions and Product Engineering. He brings in 21 Years of Experience in Tele-Communication and Utilities Industry ,has been pioneering the R&D activities in building the CIS & AMI Platform for Fluentgrid and providing the direction in execution of AMI Projects for multiple Indian Electrical Distribution Utilities.

"The overall AMI Landscape includes Unified Head End System, Network Monitoring System and Meter Data Management System. Downstream Systems are CIS, EAM Customer Selfserv, DER/ PHEV, DSM/DR, OMS, PQM, PLM, Load Forecasting, SGCC, and Grid Analytics."

Raquel Rodriguez
Tubacex Group

Alloy 617 pipes and tubes for use in A-USC boilers

Raquel Rodriguez received her Ph.D. in Material Science from CEIT- BRTA and University of Navarra in 2007. From 2003 to 2010 she was a researcher in the Materials Department of CEIT-BRTA. Since 2011 she is part of TUBACEX GROUP in the metallurgical area of continuous improvement and new product development. She leads projects related with different applications, such as mid/downstream, fertilizers, subsea and high temperature.

"An entire process route to manufacture Alloy 617 pipes and tubes has been successfully designed. The produced Alloy 617 pipes and tubes present good microstructures, mechanical properties and excellent creep response. Thick-walled pipes have been successfully welded by GTAW. The quality of the produced joints is very good. Alloy 617 welded thick-walled pipes are resistant to SRC phenomenon at 700ºC.
The results of the characterization performed show that the pipes and tubes produced by TUBACEX are a very good alternative for application in A-USC boilers."

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SESSION VII

Driving Electrification: Mobility

The electrification of mobility is undisputed, with consumers and fleets adopting at record rates as the prices of EV and battery going down. New trends of energy transition to renewable energy and Co2 emission controls will continue to disrupt electrification across passenger vehicles, light-commercial vehicles, and medium to large truck segments.
The Indian Electric Vehicle Market was valued at USD 5 billion in 2020, and it is expected to reach USD 47 billion by 2026. The rise of EV units in India will necessitate huge investments in EV charging infrastructure and distribution networks to cater to this new demand of electricity

Keynote & Session Chair

Dr Ravi Segal
Ex- Business Leader, GE
Energy Consulting

Dr. Ravi Segal retired after 24 years of engagement with GE as Business Leader – South Asia, ASEAN, China of Energy Consulting group and worked for BHEL for 12 years as a technical specialist for installation, testing, commissioning & troubleshooting of excitation and speed control systems.

He has been focusing on power system planning and grid interconnection studies and frequently serves as a consultant to the power system planners, system operators for policy recommendations on generation & transmission planning, grid codes and tariff norms for various technologies.

He has PhD in Power Systems from IIT Delhi and has over 30 publications.

"We have been talking about use of batteries for energy storage. While we are very clear about use of batteries for grid storage at large & small scale, we are also looking at how it works from grid to vehicle and back to grid. We can see lot of potential & policy support coming from the Government to push for EVs. With the new approach on radar to reduce dependency on fossil fuels, there is a clear roadmap to the EVs. Many energy distribution companies are gearing up to set up charging facilities. Already many charging stations have been set up and we do not need to worry about running out of fuel for these vehicles."

Sustainable EV Charging Infrastructure

Hitendra Vigamal
E- mobility Solutions,
Segment Manager India,
ABB India Ltd.

Hitender Vigamal has been working in ABB India Limited from 2009 and have an experience in various segments like Advance Automation systems and SCADA solutions. From 2020 onwards he has been leading E-mobility segment for ABB India Limited.

He has been in the Segment lead for ABB India's E-Mobility solutions, prime responsibilities include managing segment, creating various channels (DIRECT, OEM, System Integrator) for Electric Vehicle Charging Infrastructure, making sure smooth execution of entire life cycle of project.

Prior to this I was responsible Industry 4.0 solutions, Distributed Control System for Process Industries in ABB India Limited.

"ABB, Global Market Leader in Fast Charging of Electric Vehicles August 6, 2020 Slide 2 Actual Proven technology in the field since May 2010, now in 81 countries. The development of an interoperable charging technology is based on the parallel interconnected work in different areas. CHAdeMO is connected with JARI DC fast charge connector, specified by the JEVS (Japan Electric Vehicle Standard) The connector includes two large pins for DC power, plus other pins to carry CAN-BUS connections."

Emerging Storage Technologies

Dr Rahul Walawalkar
President & MD, Customized Energy Solutions India Pvt. Ltd. & President, India Energy Storage Alliance

Dr. Rahul Walawalkar leads the Emerging Technologies domain for Customized Energy Solutions globally, Rahul is the founder and President of the India Energy Storage Alliance and in 2020, Rahul received the 'Global Young Entrepreneur Excellence Award', recipient of Energy Storage Crusader Award in 2017, Institution of Engineers (India) Energy Award in 2014 and Computer Society of India's Young IT Professional Award for 2000 & 2001.

Rahul holds a Ph.D. in Engineering and Public Policy from Carnegie Mellon University and Master's degree in Energy Management from NYIT, United States and B.E. from Walchand College of Engineering, India.

"Our consulting services enables competitive suppliers, technology providers, marketers, utilities and customers to prosper through change, by turning knowledge into value. For E-3W category, DHI has nominated EESL to aggregate the demand. The overall idea is to bring down the upfront cost of E-3W at an affordable level. High upfront cost has remained the key barrier for the growth of high-speed E-2W's in the country."

KEY DIGNITARIES

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Oil Gas & Power.IE

25-27 October, 2021

POWER .IE 2021

Energy Transitions with Progressive Decarbonization

Monday, 25th October, 2021
Inaugural Session - 02:15 pm onwards

Chief Guest
Honourable Shri Suresh Prabhu
6 Times Member of Parliament and Former Cabinet Minister

Oil&GAS .IE 2021

Decarbonization & Growth of Oil & Gas Industry

Wednesday, 27th October, 2021
Valedictory Session - 02:15 pm onwards

Special address
Mr. Tarun Kapoor (IAS)
Secretary, MoPNG, Government of India

Refining & Petro CHEMICALS .IE 2021 | GAS WORLDTECH .IE 2021 | SURFACE ENGINEERING & Corrosion Control.IE 2021

Leadership for Oil Gas & Power. IE 2021

Mr. Amarnath, IAS
Additional Secretary, MoPNG

Mr. R K Srivastava
Director (Exploration), ONGC Ltd and Chairman, Oil & Gas World.IE 2021

Mr. E S Ranganathan
Director Marketing, GAIL (India) Ltd. and Chairman, Gas World Tech. IE 2021

Dr. SSV Ramakumar
Director (R&D and P&BD), Indian OilChairman , Refining & Petrochemicals World.IE 2021

Mr. Pankaj Kumar Goswami
Director (Operations), Oil India Ltd and Co-Chair, Oil & Gas World.IE 2021

Mr. U K Bhattacharya
Director (Projects), NTPC & Chairman, Power World.IE 2021

Mrs. Vartika Shukla
Chairperson & Managing Director, Engineers India Ltd

Mr. B Narayan
Group President-Procurements & Projects, Reliance Industries

Mr. Subramanian Sarma
Whole-time Director & Sr. Executive Vice President (Energy), Larsen & Toubro

Mr. A. K Jha
Former CMD & Director Technical , NTPC & Convener, Power World.IE 2021

Mr. S K Moitra
Former Director Onshore, ONGC & Convener, Oil & Gas World.IE 2021

Mr. Rajeev Mathur
President Growth & Policy, Cairn India & Convener, Gas World Tech.IE 2021

Mr R P Pandey
ED - CES (Onshore), ONGC Head- Advisory Committee, Surface Engineering & Corrosion Control. IE 2021

Mr K L Batra
Advisor, Chugoku Marine Paints & Convener, Surface Engineering & Corrosion Control. IE 2021

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Bharat Petroleum
energising lives

एनटीपीसी NTPC

पावरग्रिड POWERGRI

Platinum P

ऑयल इंडिया लिमिटेड
Oil India Limited
Conquering Newer Horizons

ELLIOTT GROUP
EBARA CORPORATION

Greene Tweed

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सी पी सी एल CPCL

GROWEL SINCE 1957

Greenko

EESL

FLUID CO

NIPPON PAINT

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CONNECT TO THE NETWORK

Chemicals & Process Industries
Holistic platform for latest trends in chemical processing equipment, technology & services for the downstream chemical industry.

Engineering Procurement & Construction
Connects the project owners from oil & gas, chemicals processing, power & infrastructure industries with the technology & services providers for Engineering, Procurement & Construction and allied sectors.

Specialty Chemical
Engages the manufactures & suppliers of specialty chemicals, intermediates & formulations with multiple end user industries.

Biotech & Pharma
Provides an opportunity for manufacturers of pharma products, processing equipment & allied services providing sectors.

Lab Analytix
Cutting edge lab technologies, analytical instruments & advanced automation for R&D, quality control & quality assurance across industries & research institutions.

Water Management
Utilities, technologies & advanced automation to manage water & waste water for multitude of applications across Industrial & Municipal infrastructures.

Industry Automation & Control
Process & Factory automation, Industrial electronics & Instrumentation for applications across up – mid & downstream of hydrocarbon & chemical processing industries.

Pumps, Valves & Fitting
Pumps Valves & Fittings to meet needs for fluid management across up – mid & downstream of hydrocarbon & chemical processing industries.

Paint & Surface Coating
An International Exhibition and Conference connecting the Buyers, Sellers & Influencers in the Paints, Coatings, Surface Engineering Industry

Student Outreach Program

Student Outreach Program: Student Industry interaction platform to develop future leaders for the chemical industry.

SOP Biotech: Mentorship platform for students aspiring to join various industries as biotechnology professionals in the field of R&D and pursue entrepreneurial journeys.

Oil & Gas
One stop for equipment, technology & services for E&P, hydrocarbon processing, transportation, storage & logistics for the hydrocarbon value chain.

Natural Gas & LNG Valuechain
Complete solutions for Natural Gas exploration, production, gas processing , LNG supply chain and infrastructure for transmission & distribution.

Refining & Petrochemicals
Connects the refiners and downstream petrochemicals manufacturers through common platform.

Power World Expo
Total solutions and technology innovation for application in power generation, transmission & distribution across electricity value chain.

Nuclear Energy
Equipment, technologies & services for nuclear power sector & supply chain.

Inland Waterways Ports & Logistics
Enabler for development of national waterways, rail-road-ports connectivity, warehousing & logistics.

Shipping, Marine & Ports
Maritime show for complete technology, equipment & services for ship building, repair, breaking, port development & management, manpower training & recruitment.

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Melting pot for innovative ideas in architecture and Design for professionals from global fraternity of architects & designers.

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