

2nd Global Conference on Decarbonizing India (GCDI'25)

The 2nd Global Conference on Decarbonizing India (GCDI'25) was jointly organized by the Centre for Clean Energy and Circular Economy (C-CECE) and the Centre for Sustainable Technologies (CST) at NIT Calicut from March 4-8, 2025. The conference aimed to bring together global experts, policymakers, and industry leaders to explore innovative pathways toward a sustainable, low-carbon future. Following are the different events/program conducted under GCDI'25.

Pre-conference workshop on Energy Systems and Modelling (ESM'25) – March 4-5, 2025

The Energy Systems and Modelling 2025 (ESM'25), a two-day pre-conference international workshop held on March 4–5, 2025, at NIT Calicut, marked the beginning of the Global Conference on Decarbonizing India (GCDI'25). The workshop brought together leading experts from academia and industry to engage in in-depth discussions on sustainable energy systems, advanced modelling techniques, and innovative strategies for accelerating the transition to a low-carbon future.

The workshop commenced with an inaugural session featuring a welcome address by Dr. Vijayaraj K (Coordinator, ESM'25 – GCDI), followed by opening remarks from Prof. Prasad Krishna, Director of NIT Calicut, Prof. M. L. Joy (Head of the Mechanical Engineering Department) and Prof. A. Shaija (Chair, GCDI'25). Prof. Jayanta Kapat (Co-Chair, GCDI'25), University of Central Florida, USA, delivered the inaugural address, setting the tone for the workshop. Dr. Naomi Boness, Managing Director of the Stanford Natural Gas Initiative, Stanford University, was the guest of honour for the inauguration.





ESM'25 featured a distinguished lineup of speakers who shared their insights on cutting-edge developments in energy systems and modelling:

- Prof. Jayanta Kapat, Pegasus Professor and Chair of Engineering Systems, University of Central Florida, USA, delivered a lecture on "Energy Transition – Towards Lower Emissions while Achieving Energy Independence."
- Dr. Naomi Boness, Managing Director, Stanford Natural Gas Initiative, Stanford University, provided a global perspective on "Fuelling Tomorrow: Technologies to Decarbonize Hard-to-Abate Sectors."
- Prof. Dr. Afzaal Ahmed, Assistant Professor, IIT Palakkad, presented insights into "Embrittlement in Hydrogen Storage Materials."
- Prof. Samarjeet Chanda, Associate Professor, IIT Palakkad, discussed "Phase Change Materials and Their Application to Thermal Management."

- Mr. Santosh Kumar Gurunath, CEO & Co-Founder of H2 Carbon Zero and Umanage, shared industry-specific challenges and innovative solutions for driving the green hydrogen economy.
- Other eminent speakers included Dr. Subith Vasu and Dr. Ramees K Rahman from the University of Central Florida, and leading researchers such as Prof. S. L. Sinha, Dr. Sunita Deb, Prof. Tangellapalli Srinivas, Dr. Vinod Kumar Sharma, Dr. Jithin M, and Dr. Deepa S N. Their expertise in sustainable energy and system modelling enriched the workshop's technical depth and practical relevance.

The workshop facilitated a productive exchange of ideas on improving energy efficiency, integrating renewable sources, and developing resilient energy infrastructure. The exchange of ideas between academia and industry highlighted the importance of collaborative efforts in addressing the complexities of the global energy transition.

The event concluded with a valedictory session. The welcome address was delivered by Dr. Sharu B K (Coordinator, ESM'25 – GCDI), followed by valedictory addresses from Dr. Deepa S N (Vice-Chairperson, CCECE) and Prof. Jayanta Kapat. Certificates were distributed by the dignitaries, and Prof. M. L. Joy (Head of the Mechanical Engineering Department) delivered a felicitation address. Participants shared positive feedback on the event's structure and content, emphasizing its role in shaping future research directions. The session concluded with a vote of thanks by Dr. Sanjeev Kumar Manjhi (Coordinator, ESM'25 – GCDI) and the national anthem.

ESM'25 served as a valuable platform for knowledge exchange and collaborative networking, reinforcing the commitment to advancing sustainable energy solutions and contributing to India's net-zero ambitions.

Industrial Conclave and Ecovision 2025 Exhibition – March 6, 2025

Industrial Conclave and Ecovision 2025, an exhibition showcasing cutting-edge sustainable solutions by industries and various departments and centres at NIT Calicut. The event began with an inaugural ceremony where Prof. Ravi Varma, Co-Chair of GCDI'25 and Dean - IACR, NIT Calicut, delivered the welcome address. The function was presided over by Prof. Prasad Krishna, Director of NIT Calicut. The chief guest, Mr. Anish Baijal, Corporate Vice President, Nissan Global, formally inaugurated the program. Other Guests of Honour included Dr. Jagabandhu Kole, Senior Vice President, R&D, JSW Cement; Mr. Prakash Shetty, Managing Director, Gasotech Consultancy & RSA Turbotech Pvt. Ltd.; and Dr. Arun Muley, Co-Chair of GCDI'25, Chief Engineer, and Fellow at Boeing Research and Technology, USA. They shared insights on the importance of the conclave in driving industrial transformation toward sustainability. The exhibition stalls were inaugurated by the Director of NIT Calicut with a ribbon-cutting ceremony. The conclave hosted two parallel discussions on the topics: "Opportunities and Challenges in Adopting Impactful Technologies for Decarbonization", moderated by Mr. Prakash Shetty and "Towards Net-Zeroing India", moderated by Mr. P. Jayadevan, Retired Executive Director, IOCL.



Sammelan – March 6, 2025

The GCDI'25 Sammelan, was scheduled on March 6, 2025, 6:00 p.m. at the RAVIZ Kadavu Resort, Kozhikode, and was a highly anticipated gathering dedicated to advancing sustainability and industrial decarbonization. The event brought together industry leaders, researchers, policymakers, and academicians, and were engaged in insightful discussions on pressing environmental challenges and innovative solutions to achieve Net-Zero and meet sustainability goals. The evening began with an inaugural session, our honourable Director, Prof. Prasad Krishna delivered the presidential address, Prof.A.Shaija, Chair GCDI 25 and Prof.M.K.Ravi Varma, Co-chair, GCDI 25 introduced the speakers of the evening and there was distinguished lineup of speakers, including Dr. T. P. Sethumadhavan, Professor, TD University of Health Sciences & Technology, Bengaluru & Director (R&D), Skillfavs, Dr. R. Harikumar, Director, Energy Management Centre, Govt. of Kerala and Mr. Thankachan Thomas, Vice President, Prestige Group, Bangalore who set the tone for the sammelan with their thought-provoking addresses.

The first panel discussion, moderated by Dr. G. Subbaraman, Institute Fellow and Project, Development Director, GTI Energy, USA focussed on the decarbonization of hard-to-abate industries, an area crucial to achieving global net-zero targets. Panelists from JSW Cement, Boeing Research & Technology, Stanford University, Penn State, University of Central Florida and GE Aerospace explored technological advancements, policy interventions, and industry best practices to mitigate carbon emissions in challenging sectors. The second panel discussion, led by Dr. T. P. Sethumadhavan, centered on zero-carbon strategies, featuring experts from the DST, Energy Management Centre, IIT Kanpur, and other key institutions. This session addressed policy frameworks, sustainable energy programs, and corporate initiatives driving carbon neutrality.





The Sammelan concluded with a dinner and musical evening, fostering collaboration and networking among participants. With its esteemed speakers, engaging panel discussions, and a focus on actionable sustainable solutions, GCDI'25 Sammelan played a pivotal role in shaping a sustainable and low-carbon future.

Conference – March 7-8, 2025

The two-day conference commenced on March 7, 2025, with an inaugural function at Aryabhata Hall. Dr. A. Shaija, Chair of GCDI'25 and Chairperson of C-CECE, delivered the welcome address. The traditional lighting of the lamp by the dignitaries symbolized the collective commitment to sustainable energy solutions. Prof. Prasad Krishna, Director of NIT Calicut, presided over the function, emphasizing the institution's role in fostering research collaborations for clean energy and decarbonization. The conference was officially inaugurated virtually by Shri Nitin Gadkari, Hon'ble Union Cabinet Minister for Road Transport and Highways, who delivered the inaugural address. He outlined India's policy initiatives and strategic vision for achieving carbon neutrality in the transportation and infrastructure sectors.

The session also featured addresses from esteemed Guests of Honour:

- Dr. Ranjith Krishna Pai, Senior Director, Climate, Energy, and Sustainable Technology (CEST), DST, Government of India, highlighted opportunities in DST projects for indigenous hydrogen technologies.
- Dr. P.V. Aravind, University of Groningen, Netherlands, discussed the hydrogen value chain and the importance of public-private partnerships.
- Dr. Naomi Boness, Managing Director, Natural Gas Initiative, Stanford University, emphasized the global urgency of decarbonization.
- Mr. P. Jayadevan, Retired Executive Director of IOCL, stressed the need for a comprehensive energy index to guide policy and industry strategies.

The inaugural session concluded with a Vote of Thanks delivered by Dr. Panneerselvam R, Co-Chair of GCDI'25 and Chairperson of CST, NIT Calicut, who acknowledged the contributions of the guests, organizing committee, and participants.





Key Highlights of GCDI'25

The conference hosted a diverse gathering of dignitaries from academia and industry, featuring:

- 7 plenary sessions
- 23 parallel keynote sessions
- 79 oral presentations
- 125 poster presentations

The discussions revolved around key themes such as clean energy, clean fuel, and decarbonization, fostering knowledge exchange and collaborative innovation. The GCDI '25 provided a platform for stakeholders to discuss and promote sustainable energy solutions. The event reinforced NIT Calicut's role as a centre for innovation and climate action, paving the way for future advancements in decarbonization and clean energy technologies.

The best oral and poster presentation awards for each theme also are presented at the end of the conference.





The selected papers of GCDI'25 will be reviewed and published in various SCI journals such as Applied Thermal Engineering Journal, Elsevier Publisher, Special issue on 'Energy Storage and Efficient Energy Utilization', in Energy Storage, and 'Climate Resilience and Sustainability' Journal, John Wiley and Sons Inc. Publisher. In addition, Springer will publish the select proceedings of GCDI 2025 as part of the series - Springer Proceedings in Energy.

Finally, the conference was concluded with the remark of next edition of GCDI at PSG College of Technology, Coimbatore in January 2026.