



भारतीय प्रौद्योगिकी संस्थान दिल्ली

Indian Institute of Technology Delhi

Schedule

# ICCNTSD-2023

INTERNATIONAL CONFERENCE ON

**CARBON NEUTRAL TECHNOLOGY FOR SUSTAINABLE DEVELOPMENT**

TAIWAN-INDIA EXCHANGE WORKSHOP ON

**SUSTAINABLE RENEWABLE ENERGY AND SMART ENERGY STORAGE TECHNOLOGY**

 Seminar Room, IIT Delhi



organized by

**Indian Institute of Technology Delhi**

in association with

**National Science and Technology Council (NSTC),**

**Taiwan**

&

**Energy Storage Platform on Batteries, DST-IIT Delhi**

**4-6 SEPTEMBER**

**2023**

[www.iccntsd.com](http://www.iccntsd.com)



## About 2023 International Conference on Carbon Neutral Technology for Sustainable Development

The 2023 International Conference on Carbon Neutral Technology for Sustainable Development (ICCNTSD-2023) is an internationally recognized forum, bringing together scientists, engineers, policy-makers, and industry leaders from around the globe. The conference serves as a platform for robust discussions, knowledge exchange, and collaboration on the latest breakthroughs and advancements in carbon-neutral technology and its role in fostering sustainable development.

ICCNTSD-2023 will focus on various aspects of carbon-neutral technologies, including Carbon Capture, Storage, and Utilization (CCSU), renewable energy technologies, green manufacturing, biofuels, hydrogen energy, energy efficiency, and electric mobility. The conference will feature keynote speeches, panel discussions, workshops, and technical sessions where delegates will present their research findings, offering innovative solutions for reducing carbon emissions and achieving global sustainability goals.

This conference is jointly organized by Indian Institute of Technology, Delhi and National Science and Technology Council (NSTC), Taiwan to provide an ideal setting for attendees to foster international collaborations, thus accelerating the global transition to a sustainable and carbon-neutral world.

### Topics:

- ◆ Hydrogen Production and Utilization
- ◆ Smart Energy Storage
- ◆ CCUS (CO<sub>2</sub> Capture, Utilization, Storage, CCU)
- ◆ Circular Economy
- ◆ Others Sustainable Technology

## About 2023 Taiwan-India Exchange Workshop on Sustainable Renewable Energy and Smart Energy Storage Technology

The 2023 Taiwan-India Exchange Workshop on Sustainable Renewable Energy and Smart Energy Storage Technology is an initiative aimed at strengthening the bilateral ties between Taiwan and India in the field of renewable energy and energy storage technologies. This joint venture, organized by key stakeholders from both nations, is focused on addressing the current and future challenges in the sustainable energy sector.

The workshop aims to promote the exchange of knowledge, research, and technical capabilities between Taiwanese and Indian experts, industry leaders, researchers, and policymakers. The agenda includes comprehensive discussions on the latest advancements in renewable energy technologies such as solar, wind, hydro, and bioenergy, as well as innovative developments in energy storage systems like batteries, supercapacitors, and energy storage in grid applications.

The Taiwan-India exchange workshop also seeks to pave the way for future collaborations, projects, and joint ventures between the two countries, further advancing the global sustainable energy landscape. The event underscores the commitment of both nations to working together in their pursuit of energy sustainability and resilience.





## About Indian Institute of Technology Delhi

Indian Institute of Technology Delhi is one of the 23 IITs created to be Centres of Excellence for training, research and development in science, engineering and technology in India.

Established as College of Engineering in 1961, the Institute was later declared as an Institution of National Importance under the “Institutes of Technology (Amendment) Act, 1963” and was renamed as “Indian Institute of Technology Delhi”. It was then accorded the status of a Deemed University with powers to decide its own academic policy, to conduct its own examinations, and to award its own degrees.

Since its inception, over 48000 have graduated from IIT Delhi in various disciplines including Engineering, Physical Sciences, Management and Humanities & Social Sciences. Of these, nearly 5070 received Ph.D. degrees. The number of students who graduated with B.Tech. degree is over 15738. The rest obtained Master’s Degree in Engineering, Sciences and Business Administration. These alumni today work as scientists, technologists, business managers and entrepreneurs. There are several alumni who have moved away from their original disciplines and have taken to administrative services, active politics or are with NGOs. In doing so, they have contributed significantly to building of this nation, and to industrialization around the world.





## About National Science and Technology Council, Taiwan

The National Science and Technology Council (NSTC), Taiwan is a nodal agency that aims to meet four objectives which support the goal of national globalization for Taiwan. Firstly, to boost the bilateral and multilateral scientific exchanges and activities. Secondly, to promote and bridge the cooperation amongst scientists, institutes, and universities. Thirdly, to act as a representative office of the Science Parks in Taiwan and to respond to the transfer of knowledge and of technology and fourthly to collect and to evaluate information.

The National Science and Technology Council (NSTC), Taiwan is conducting several bilateral and multi-lateral joint international cooperation programs with countries in Europe, Asia, the Americas, and Africa including India. The priority areas for joint R&D projects supported by NSTC, Taiwan Projects are Artificial Intelligence, IoT (Internet of Things), Big Data, Cyber Security, Green Energy Technology/ Renewable Energy (solar energy and bioenergy)/ Clean Energy, Micro/Nano-electronics, embedded systems & sensors, Biotechnology, Health care including functional genomics, drug development and bio-medical devices, Agriculture and Food Sciences India.

NSTC is associated with various international collaboration activities with Indian counterparts such as Ministry of New and Renewable Energy, Ministry of Environment, Forest and Climate Change, Indian Space Research Organization, Global Innovation & Technology Alliance, Indian Council of Social Science Research, Department of Science and Technology, Department of Biotechnology, Ministry of Earth Sciences, Council of Scientific and Industrial Research. It supports implementation of various program of Cooperation between India and Taiwan, and currently it is inviting joint research proposals for support under Indo-Taiwan S&T cooperation program. This program will extend financial support to the scientists and researchers in India to carry out various research and scientific experimentation and exchange of innovative thoughts with their Taiwanese counterpart in the defined areas to meaningfully contribute towards the industrial developmental activities.



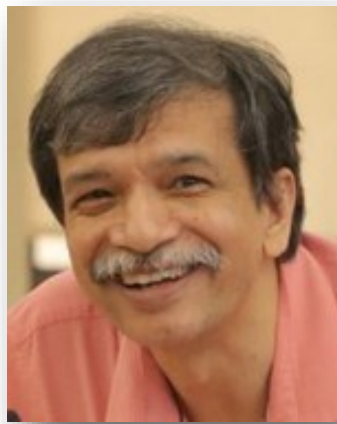


## Patrons



**Prof. Chin-Tsan WANG**

Counsellor & Director, NSTC,  
Professor, National Ilan University,  
Yilan, Taiwan



**Prof. Rangan Banerjee**

Director, IIT Delhi, India



**Prof. Sudhasatwa Basu**

Professor (HAG),  
Department of Chemical  
Engineering, IIT Delhi, India

## Convenors



**Prof. Rajendra S. Dhaka**

Associate Professor,  
Department of Physics, IIT Delhi,  
India



**Prof. Chyi-How LAY**

Professor  
Feng Chia University,  
Taiwan





**2023 International Conference on  
Carbon Neutral Technology for Sustainable Development  
&  
2023 Taiwan-India Exchange Workshop on  
Sustainable Renewable Energy and Smart Energy Storage Technology  
organized by**

**Indian Institute of Technology Delhi**

*in association with*

**National Science and Technology Council (NSTC), Taiwan**

*and*

**Energy Storage Platform on Batteries (ESPOB), DST-IIT Delhi**

**Venue: Seminar Hall, IIT Delhi**

**Dates: September 4-6, 2023**

Schedule of the Program

**Day 0: Monday, September 4<sup>th</sup>, 2023**

Social Interaction cum Networking Session and welcome dinner (18:30-20:30)

**Day 1: Tuesday, September 5<sup>th</sup>, 2023**

Arrival (08:30-09:00)		
TIME	SESSION	RESOURCE PERSONS
9:00-9:45	Registration	Volunteers
10:00-10:25	<b>INAUGURAL SESSION</b>	
Welcome address and about the event: Prof. Rajendra S. Dhaka, IIT Delhi		
Address by Prof. Rangan Banerjee, Director IIT Delhi		
Address by Ambassador Baushuan Ger, Taipei Economic & Cultural Center, India		
Address by Prof. James Gomes, Dean (International office), IIT Delhi		
Address by Prof. Naresh Bhatnagar, Dean (Research and Development), IIT Delhi		
Vote of thanks Prof. Chyi How Lay, Taiwan		





Time	Topic of Presentation	Name & Affiliation of Speaker
Keynote-1 10:25-10:50	Inaugural lecture	Rangan Banerjee, IIT Delhi, India
Invited-1 10:50-11:10	Progress of Indo-Taiwan Joint projects in Taiwan	C. T. Wang, Taipei Economic & Cultural Center, India
<b>GROUP PHOTO and TEA BREAK and POSTER SESSION (11:10-11:40)</b>		
<b>TECHNICAL SESSION - 1: 11:40-13:00</b> Session Theme: Carbon Neutral & Environmental, Energy Materials Session Chair: C. T. Wang		
Time	Topic of Presentation	Name & Affiliation of Speaker
Keynote-2 11:40 - 12:10	BAT-CAP Hybrid Energy Storage Materials	Subhasish Basu Majumder, IIT Kharagpur, India
Keynote-3 12:10 - 12:40	1. Big Success: Biomass gasification with Super-critical cycle for energy supply system 2. The Key Issues of Hydrogen Technology Projects under NSTC	Shu-San Hsiau, National Central University, Taiwan (online)
Invited-2 12:40-13:00	Environmental and Electrochemical Stability of 'Layered' Na- Transition Metal Oxide based Cathode Materials for Na-ion Batteries	Amartya Mukhopadhyay, IIT Bombay, India
<b>NETWORKING and LUNCH BREAK (13:00-14:00)</b>		
<b>TECHNICAL SESSION-2: 14:00-16:10</b> Session Theme: Carbon Neutral & Environmental, Energy Storage Session Chair: Chyi How Lay and Anil Verma		
Time	Topic of Presentation	Name & Affiliation of Speaker
Keynote-4 14:00-14:30	Fuel cells and electrolytic cells development in NCU	Chung-Jen Tseng, National Central University, Taiwan (online)
Invited-3 14:30-14:50	Development of Metal-CO <sub>2</sub> Battery: A New Strategy for a Sustainable Future	C. S. Sharma, IIT Hyderabad, India
Invited-4 14:50-15:10	In-silico study of potential electrode materials for rechargeable batteries	Priya Johari, Shiv Nadar University, India
Invited-5 15:10-15:30	Engineering the Interfaces for Integrated CO <sub>2</sub> Capture and Utilization using Electrochemical Conversion	Pravin P Ingole, IIT Delhi, India





Invited-6 15:30-15:50	Rapid Green Analytical Technologies for environmental analysis	V. K. Ponnusamy, Kaohsiung Medical University, Taiwan
Keynote-5 15:50-16:20	Emerging Energy Generation and Storage Technologies: The Path to Net-Zero Emissions	Tapas Kuila, CSIR-CMERI Durgapur, India ( <a href="#">online</a> )
<b>TEA BREAK and POSTER SESSION (16:20-17:00)</b>		
<b>TECHNICAL SESSION-3: 17:00-19:10</b> <b>Session Theme:</b> Hydrogen production & utilization, Energy Storage, Carbon Neutral <b>Session Chair:</b> Siu-Hang Godwin Chan		
Time	Topic of Presentation	Name & Affiliation of Speaker
Keynote-6 17:00-17:30	Hydrogen Production in 3D-Printed Micro Electrolyzer	Suddhasatwa Basu, IIT Delhi, India
Invited-7 17:30-17:50	Circular Economy Site Location for Reusable Cup Machine	Siu-Hang Godwin Chan, Feng Chia University, Taiwan
Invited-8 17:50-18:10	Greening of Chemicals Manufacture & Transition to a Sustainable, Carbon Neutral Economy	Priyanka Bajaj, NIPER Hyderabad, India
Invited-9 18:10-18:30	Design and Development of Solid State Batteries	Yogesh K. Sharma, IIT Roorkee, India
Invited-10 18:30-18:50	Development of sodium-ion batteries: joint efforts through Indo-Taiwan project	R. S. Dhaka, IIT Delhi, India
Invited-11 18:50-19:10	Smart Observer for Protecting Labour Rights: AI-based Distant Water Fishermen Work Hour Estimation	Pao-Ann Hsiung, National Chung Cheng University, Taiwan ( <a href="#">Online</a> )
<b>CONFERENCE DINNER (19:10-21:00)</b>		

**Day 2: Wednesday, September 6<sup>th</sup>, 2023**

<b>TECHNICAL SESSION-4: 09:30-11:00</b> <b>Session Theme:</b> Renewable Energy and Storage Technology <b>Chair:</b> R. S. Dhaka		
Time	Topic of Presentation	Name & Affiliation of Speaker
Keynote-7 09:30-10:00	Aqueous Rechargeable Batteries	A. J. Bhattacharyya, IISc Bangalore, India







Invited-12 10:00-10:20	Towards a Net Zero Emissions for the Philippines	Alvin B. Culaba, De La Salle University Manila, Philippines ( <a href="#">Online</a> )
Invited-13 10:20-10:40	Strategies to Stabilize the Sodium metal anode for High-energy Room-temperature Sodium-Sulfur Batteries	Vipin Kumar, IIT Delhi, India
Invited-14 10:40-11:00	Dual-Duty Innovation: Two-Dimensional Aluminum Anodes for Metal Ion Batteries and Promising Prospects for Hydrogen Storage	Nirat Ray, IIT Delhi, India
<b>TEA BREAK and POSTER SESSION (11:00-11:30)</b>		
<b>TECHNICAL SESSION-5: 11:30-13:00</b> <b>Session Theme:</b> Green Energy and New Generation of Energy Storage Technology <b>Session Chair:</b> Priyanka Bajaj		
Time	Topic of Presentation	Name & Affiliation of Speaker
Keynote-8 11:30-12:00	Porous Carbon Electrodes for High Energy Density Quasi-solid-state Flexible Supercapacitors	S. A. Hashmi, Delhi University, India
Invited-15 12:00-12:20	Designing greener energy conversion system for a sustainable future	C. N. Tharamani, IIT Ropar, India
Invited-16 12:20-12:40	Bio-coal and carbon reduction potential in electricity sector	Priyanka Kaushal, IIT Delhi, India
Invited-17 12:40-13:00	Sustainable electrode materials for high performance Lithium-Sulfur batteries	Bhanu Nandan, IIT Delhi, India
<b>NETWORKING and LUNCH BREAK (13:00-14:00)</b>		
<b>TECHNICAL SESSION-6: 14:00-16:00</b> <b>Session Theme:</b> New Venture Experiment Sharing, Carbon Neutral and Environmental Sustainability <b>Session Chair:</b> Jason Ho		
Time	Topic of Presentation	Name & Affiliation of Speaker
Keynote-9 14:00-14:30	Lignocellulosic Biomass derived carbons for sustainable and carbon neutral applications	Thallada Bhaskar, CSIR-Indian Institute of Petroleum Dehradun, India
Invited-18 14:30-14:45	Taiwan Green Energy Industry and Energy Taiwan Exhibition Introduction	Steven Chien Chun Liu, Taipei World Trade Center, New Delhi, India





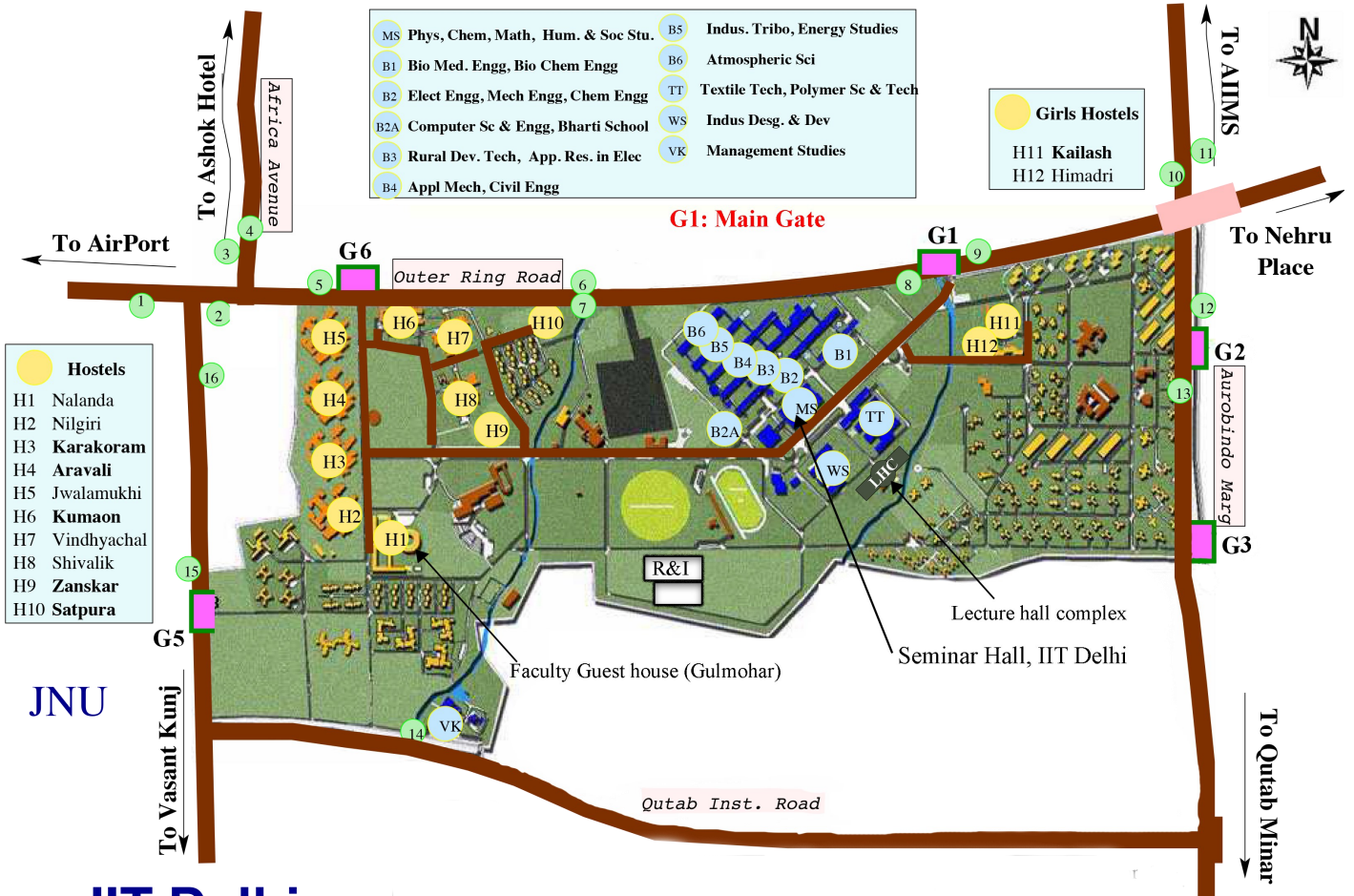
Invited-19 14:45-15:00	The applications of polymer technology in renewable energy industry	Hengchia Kuo, Plastics Industry Development Center, Taiwan (Online)
Invited-20 15:00-15:15	Limitations and Possibilities of Hydrogen Gas as a Prolific Source of Energy	R. N. Malik, Haryana State, India
Invited-21 15:15-15:30	Case Studies of Fuel Cells in Various Application Scenarios	Ray Lin, Eco-Energy Technology Co. Ltd., Taiwan (Online)
Invited-22 15:30-15:45	Smart Factory and Carbon Neutrality	Jason Ho, Taisys Technologies Co. Ltd., Taiwan
Invited-23 15:45-16:00	Tata Steel's tryst with sustainable development	Mriganshu Guha, Tata Steel India, India
<b>TEA BREAK and POSTER SESSION (16:00-16:30)</b>		
<b>TECHNICAL SESSION-7: 16:30-17:40</b> Session Theme: Carbon Neutral and Environmental Sustainability, Projects Session Chair: Chyi How Lay		
Time	Topic of Presentation	Name & Affiliation of Speaker
Keynote-10 16:30-17:00	Non-conventional Plastic Research cum Management for Environmental sustainability	Vimal Katiyar, IIT Guwahati, India
Invited-24 17:00-17:15	Torrefied waste biomass as carbon neutral sustainable material for energy generation	Sanjay Dhakate, NPL New Delhi, India
Invited-25 17:15-17:30	Enhancing cycle stability of soluble lead flow battery by Max phase $Ti_3AlC_2$ Decorated Electrode	Karthik Kiran Sarigamala, IIT Bombay, India
Invited-26 17:30-17:50	Progress of Indo-Taiwan Joint project in India	Rajiv Kumar, Department of Science & Technology (DST), India
<b>CONCLUDING SESSION (17:50-18:00)</b>		
<b>DEPARTURE (18:00)</b>		

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# IIT Delhi Campus map



## IIT Delhi Campus Map





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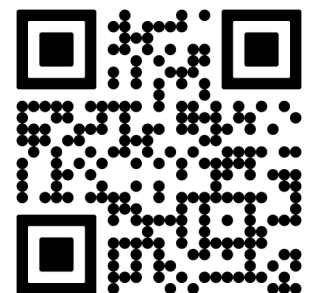


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