



News Release

Singapore, 17 January 2025

NTU Singapore, India's Energy Department of the Government of Odisha, and Indian Institute of Technology, Bhubaneswar collaborate to advance R&D in sustainable energy technologies

Nanyang Technological University, Singapore (NTU Singapore), India's Energy Department of the Government of Odisha, and Indian Institute of Technology, Bhubaneswar (IIT Bhubaneswar) are collaborating to develop new technologies in renewable energy, hydrogen production, energy storage systems, and microgrids.

A **Memorandum of Understanding (MoU)** was signed on 17 January 2025 in Odisha, India, on the sidelines of Singapore's President Tharman Shanmugaratnam's official visit to India.

Professor Madhavi Srinivasan, Executive Director of the Energy Research Institute @ NTU (ERI@N), signed the agreement on behalf of NTU Singapore, alongside Mr Debi Dutta Tripathy, FA-cum-Additional Secretary to the Government of Odisha's Energy Department, and Professor Prasant Kumar Sahu, Dean of Alumni Affairs and International Relations, IIT Bhubaneswar.

The collaboration aims to drive innovation in renewable energy technologies by focusing on advancements in solar, wind, hydro, waste-to-energy and other new and renewable energy systems. These technologies will be developed to improve efficiency and optimise resource use, addressing the region's growing energy demands with decarbonisation.

Energy storage solutions are another critical area, with research targeting enhancements in battery energy storage systems and exploring alternative storage methods such as hydrogen, chemical, gravitational, and pneumatic solutions.

Hydrogen production and storage, particularly through cost-effective and safer methods such as electrolysis using seawater and sewage water, will also be a key focus of the partnership.

NTU Vice President (Industry), Professor Lam Khin Yong, said: "This partnership underscores NTU's commitment to address critical global challenges through

interdisciplinary translational research and international collaborations with both industry and academia. By leveraging NTU's expertise in advanced energy technologies and working closely with partners, we aim to accelerate the development of sustainable and resilient energy systems that will benefit Singapore, India, and the wider region."

Research efforts will also study microgrid technologies and grid management solutions to enable the seamless integration of renewable energy sources. These initiatives include examining energy market dynamics, such as deregulated markets and economic analyses, to address the challenges of large-scale renewable energy integration. Additionally, the partnership will explore energy-efficient buildings and processes, alongside climate and environmental studies, to support sustainability goals.

Executive Director of NTU's ERI@N, Professor Madhavi Srinivasan, said: "This collaboration builds on NTU's strong foundation in energy innovation and sustainability, enabling us to co-develop cost-effective and scalable renewable energy solutions with our partners in India. Beyond research, this partnership will also focus on capacity-building initiatives, including student and faculty exchange programmes to foster knowledge sharing and cross-disciplinary learning."

Director, IIT Bhubaneswar Prof Shreepad Karmalkar said "The MoU between Energy Department, Government of Odisha, IIT Bhubaneswar and NTU Singapore will create a stronger collaborative platform to address various issues including New and Renewable Energy Systems, Storage Technologies, Energy management in Micro Grid and Smart Grids, Market and Deregulation in current energy systems with multiple energy vectors, Green Hydrogen Eco-systems etc. Further, we will extend our collaborative effort in other emerging domains such as Semiconductor Technology, Communication systems, AI and Computing, Waste Management, Water resource management, Mineral and Martials technologies etc.

This collaboration will enhance student exchange program with the NTU Singapore, creating larger space for technology innovation and new knowledge dissemination in the emerging need of both the Countries. This platform will nurture fresh talents and engaging them in advancing technologies to meet tomorrow's challenges. This industry-academia interface will build bigger platform for start-up ecosystems fuelling innovation and economy."

Principal Secretary, Energy Department, Mr. Vishal Kumar Dev said: "With a vision to add 10 GW of Renewable Energy capacity in the State of Odisha by 2030, all necessary steps are being taken by the Government to create a conducive environment for development of RE Projects. This collaboration was conceived during our Hon'ble Chief Minister, Sri Mohan Kumar Majhi's official visit to Singapore during the last November. This tie up between IIT Bhubaneswar and NTU Singapore, the top-notch technological universities of India and Singapore, will focus on research for efficiency-improvement and cost-optimisation in all aspects of Renewable Energy

Sector, i.e. Generation, Storage, Transmission and Utilisation. Scope of research will also include advanced Energy Storage through Green Hydrogen, Battery Storage, Pumped Hydro Storage, Gravitational and Pneumatic solutions. This collaborative arrangement will also pave the way for knowledge sharing through student & faculty exchange.

Odisha and Singapore have a maritime link dating back to the Before Christ Period for the exchange of commodities. This MoU will re-new the link, this time for the exchange of knowledge.”

Training and upskilling programmes for professionals in the renewable energy sector will also ensure that industry players are well-equipped to address emerging challenges and harness cutting-edge technologies, paving the way for a greener and more inclusive future.

This partnership combines the strengths of academia and industry to accelerate the development of transformative energy technologies, paving the way for sustainable energy infrastructures and nurturing the talents needed by the industry.

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About Nanyang Technological University, Singapore

A research-intensive public university, Nanyang Technological University, Singapore (NTU Singapore) has 35,000 undergraduate and postgraduate students in the Business, Computing & Data Science, Engineering, Humanities, Arts, & Social Sciences, Medicine, Science, and Graduate colleges.

NTU is also home to world-renowned autonomous institutes – the National Institute of Education, S Rajaratnam School of International Studies and Singapore Centre for Environmental Life Sciences Engineering – and various leading research centres such as the Earth Observatory of Singapore, Nanyang Environment & Water Research Institute and Energy Research Institute @ NTU (ERI@N).

Under the NTU Smart Campus vision, the University harnesses the power of digital technology and tech-enabled solutions to support better learning and living

experiences, the discovery of new knowledge, and the sustainability of resources.

Ranked amongst the world's top universities, the University's main campus is also frequently listed among the world's most beautiful. Known for its sustainability, NTU has achieved 100% Green Mark Platinum certification for all its eligible building projects. Apart from its main campus, NTU also has a medical campus in Novena, Singapore's healthcare district.

For more information, visit www.ntu.edu.sg

About IIT Bhubaneswar:

IIT Bhubaneswar is one of the premier institutes of India with more than 3000 students and more than 200 faculty members. The institute has various Engineering, Science and Humanities programs, creating an eco-system for state-of-the-art teaching-learning process and cutting-edge research in emerging areas including Energy, Semiconductor, AI and Computing, Communications systems, Manufacturing, Materials, Disaster management etc.

The institute has established Centre of Excellences in Augmented and Virtual Reality, AI and High-Performance Computing, Design and Innovation Centre, S.K. Dash Centre of Excellence, Centre for Energy Materials and Bay of Bengal Coastal Observatory etc. To address the cutting-edge trends in technology development. Further, the institute is in a process of building a large start-up ecosystem incubating 100 start-ups and is one of its kind in this country.

The third largest campus in IIT systems spanning over 936 acres of area, the institute has created an eco-friendly campus environment for the students, faculty members and other supporting units. The institute extends all its arms for creating a vibrant industry-academia platform for new knowledge dissemination and outreach.