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NTU Singapore and Trinasolar to advance AI-powered smart energy storage solutions

Nanyang Technological University, Singapore (NTU Singapore) and **Trinasolar**, a global smart photovoltaic (PV) and energy storage solutions provider, are collaborating to develop smart energy storage systems (ESS) to enhance efficiency, reliability, and economic viability in renewable energy applications.

As solar, wind, and hydrogen energy sources expand globally, energy storage technologies will play a critical role in ensuring power grid stability and optimising energy use.

Led by the **Energy Research Institute @ NTU (ERI@N)**, the collaboration aims to develop AI-driven tools that can improve investment decisions, enhance system stability through intelligent energy forecasting, and deploy smart optimisation algorithms for diverse energy storage applications.

By combining Trinasolar's expertise in PV and ESS technologies with NTU's leading research in energy innovation, the collaboration seeks to address key challenges in smart energy storage through **three strategic focus areas:**

1. **Smart Investment Decision-making**
   Conventional energy storage investments often face uncertainties due to market volatility and evolving regulations. NTU and Trinasolar will develop a techno-economic modelling tool that integrates meteorological data, market regulations, and electricity price trends to generate optimal storage configurations. This tool will provide investors with clear economic metrics, such as return on investment (ROI) and payback periods, enabling better financial planning and risk mitigation.

2. **Ensuring System Stability with AI-Powered Forecasting**
   Renewable energy output is inherently intermittent, making energy management challenging. The team will develop machine learning-driven forecasting models that predict solar and wind energy generation, local

electricity demand, and market price fluctuations. These data-driven insights will enable energy storage systems to autonomously adjust charge and discharge cycles, ensuring a stable supply-demand balance while maximising cost savings.

3. **Smart Optimisation Algorithms**
   Energy storage systems must operate efficiently across different applications, from large-scale battery farms to commercial and industrial (C&I) energy storage. The partnership will develop intelligent energy management algorithms to enhance performance in areas such as energy arbitrage, peak shaving, and ancillary services. These self-learning algorithms will enable energy storage systems to adapt in real-time, improving asset utilisation and profitability.

NTU and Trinasolar formalised their partnership through a signing of a technology research collaboration agreement.

NTU Vice President (Industry) Professor Lam Khin Yong, highlighted the importance of academia-industry collaboration: “This partnership between NTU and Trinasolar reflects our commitment to advancing energy technologies that will support global efforts towards a low-carbon future. NTU has deep links with industry players and a strong track record in successful industry collaborations for renewable energy powergrids, thus enabling smooth commercialisation pathways for any intellectual property developed in our joint partnerships. By aligning cutting-edge research with industry needs, we want to develop impactful solutions that build a more sustainable and energy-resilient future.”

Helena Li, Executive President, Trinasolar emphasised the company’s commitment to research and development collaborations to create cutting-edge solar solutions: “As one of the global leading manufacturers of PV and ESS solutions with 30 world records under our belt, Trinasolar brings to the table its expertise in global solar-storage market trends and cutting-edge technologies. We are proud to collaborate with NTU, a top-tier research institution renowned for its academic excellence. This initiative aims to deliver tangible value to energy storage customers, including cost optimisation, improved return on investment (ROI), and enhanced system reliability.”

Executive Director of ERI@N Professor Madhavi Srinivasan added that energy storage is a key enabler of renewable energy adoption. “By combining NTU’s expertise in renewable energy and energy storage research with Trinasolar’s global leadership in solar and storage solutions, this partnership will drive real-world impact, helping shape the future of energy resilience and sustainability through advanced AI applications.”

The collaboration will be led by **NTU Associate Professor Xu Yan, Cluster Director of Smart Grids and Microgrids at ERI@N**, and **Director, Centre for Power Engineering** at the **School of Electrical and Electronic Engineering**.

Trinasolar and NTU Singapore are committed to deepening their collaboration in AI-powered energy storage applications and developing innovations to meet the evolving demands of the renewable energy sector.

Both parties have a shared vision of advancing the global energy transition and promoting sustainable development, paving the way for a smarter, more resilient energy future.

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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 Trinasolar

Founded in 1997, Trinasolar Co., Ltd. (stock symbol: Trinasolar; stock code: 688599) is mainly engaged in PV products, PV systems and smart energy. PV products include R&D, production and sales of PV modules. PV systems consist of power stations and system products. Smart energy mainly comprises PV power generation and operation & maintenance, smart solutions for energy storage, smart microgrid, and development and sales of multi-energy systems.

With the strategic goal of "Creating a new industrial ecosystem led by Trinasolar and promoting Trinasolar as a leader in smart PV and energy storage solutions," we are committed to leading the way in smart PV and energy storage solutions and facilitating the transformation of new power systems for a net-zero future. On June 10, 2020, Trinasolar was listed on the Science and Technology Innovation Board (STAR Market) of the Shanghai Stock Exchange (SSE). It is the first PV and energy storage company that has gone public on the STAR Market providing PV products.

For more information, visit: www.trinasolar.com