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## **Hitachi ABB Power Grids teams up with NTU Singapore to take Solid State Transformer technology to the next level**

*Cross-stakeholder collaboration to support a Government priority project aimed at enhancing the power grid*

**Singapore, 26 March, 2021** – Hitachi ABB Power Grids, a global technology leader, and Nanyang Technological University, Singapore (NTU Singapore), a leading research-intensive university, will work together to advance developments in Solid State Transformer (SST) technology. The project is led by the Energy Research Institute @ NTU (ERI@N), and is supported by the National Research Foundation, Singapore (NRF).

The project is part of the Singapore Government's flagship Energy Grid 2.0 initiative aimed at shaping the next-generation grid system and transforming how energy is managed by consolidating multiple energy sources into a single intelligent network that is more efficient, sustainable and resilient.

"As a global technology leader, we are delighted to partner with NTU in this cross-stakeholder collaboration project, bringing together government, academia and industry in an effort to accelerate energy transition and enhance quality of life," said Gerhard Salge, Chief Technology Officer, Hitachi ABB Power Grids.

Transformers are a key component of electrical systems found across the power value chain. They are electrical devices that transfer electrical energy from one circuit to another through the process of electromagnetic induction and are mostly deployed to 'step up' or 'step down' voltage levels between circuits at nominal frequency.

Solid state transformers (SST) incorporate power semiconductor components, control circuits and high-frequency transformers, offering bi-directional power flow control, harmonics reduction, and many other benefits. They allow conversion from Alternate Current (AC) to Direct Current (DC), DC to AC and also DC to DC on different voltage levels. They are designed to support power system transformation towards more flexible AC and DC mixed system configurations, facilitating the integration of renewable energy sources close to DC loads.

This new grid architecture can also benefit applications such as data centers, wind farms, solar plants, hydrogen generation and electric vehicle charging infrastructure. The partnership can also contribute to land scarcity challenges faced by Singapore. As a small island nation, the country has always sought innovative solutions to stretch its land options, while balancing commercial needs and sustainability.

NTU's Senior Vice President (Research) Professor Lam Khin Yong, said, "The Solid State Transformers (SST) are multifunctional and will allow users flexible control on the amount of power that is distributed to networks." Lam continued, "By doing away with multiple separate equipment required by current conventional transformers, we

also save on land-use, making the SST an attractive solution for a more efficient electricity grid.”

“One of the key objectives in partnering with Hitachi ABB Power Grids for this project is to take the technology to the next level – from lab to real world applications. Both organizations have considerable knowledge and experience in the development of SST technology and we are confident that this partnership will catalyse commercial deployment to support a sustainable energy future,” Professor Lam added.

Beyond the SST project, Hitachi ABB Power Grids and NTU have also been cooperating in several areas of advancement in grid technologies, including energy storage systems and e-mobility.

"Singapore is at the forefront when it comes to the sustainable development of smarter cities and the power grid is an integral contributor," said Nirupa Chander, Managing Director, Hitachi ABB Power Grids, Singapore. "We are proud to work with NTU and NRF on this project of national and international relevance," Nirupa added.

Dr Yeoh Lean Weng, Senior Director for Urban Solutions and Sustainability at NRF, said, "The partnership between NTU and Hitachi ABB Power Grids is one of many examples that demonstrates the international recognition our local institutions receive for scientific excellence." He continued, " Singapore is committed to supporting cutting edge research that not only meets our national needs, but through wider partnerships, advance the benefits beyond our shores."

#### **About Hitachi ABB Power Grids Ltd.**

Hitachi ABB Power Grids is a global technology leader with a combined heritage of almost 250 years, employing around 36,000 people in 90 countries. Headquartered in Switzerland, the business serves utility, industry and infrastructure customers across the value chain, and emerging areas like sustainable mobility, smart cities, energy storage and data centers. With a proven track record, global footprint and unparalleled installed base, Hitachi ABB Power Grids balances social, environmental and economic values. It is committed to powering good for a sustainable energy future, with pioneering and digital technologies, as the partner of choice for enabling a stronger, smarter and greener grid. <https://www.hitachiabb-powergrids.com>

#### **About Nanyang Technological University, Singapore**

A research-intensive public university, Nanyang Technological University, Singapore (NTU Singapore) has 33,000 undergraduate and postgraduate students in the Engineering, Business, Science, Humanities, Arts, & Social Sciences, and Graduate colleges. It also has a medical school, the Lee Kong Chian School of Medicine, set up jointly with Imperial College London.

NTU is also home to world-class autonomous institutes – the National Institute of Education, S Rajaratnam School of International Studies, Earth Observatory of Singapore, and Singapore Centre for Environmental Life Sciences Engineering – and

various leading research centres such as the Nanyang Environment & Water Research Institute (NEWRI) and Energy Research Institute @ NTU (ERI@N).

Ranked amongst the world's top universities by QS, NTU has also been named the world's top young university for the past seven years. The University's main campus is frequently listed among the Top 15 most beautiful university campuses in the world and it has 57 Green Mark-certified (equivalent to LEED-certified) building projects, of which 95% are certified Green Mark Platinum. Apart from its main campus, NTU also has a campus in Singapore's healthcare district.

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.

[www.ntu.edu.sg](http://www.ntu.edu.sg)

#### **About the National Research Foundation (NRF), Singapore**

The National Research Foundation (NRF) is a department within the Prime Minister's Office. NRF sets the national direction for research and development (R&D) by developing policies, plans and strategies for research, innovation and enterprise. It also funds strategic initiatives and builds up R&D capabilities by nurturing research talent. The NRF aims to transform Singapore into a vibrant R&D hub that contributes towards a knowledge-intensive, innovative and entrepreneurial economy; and make Singapore a magnet for excellence in science and innovation. [www.nrf.gov.sg](http://www.nrf.gov.sg)

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