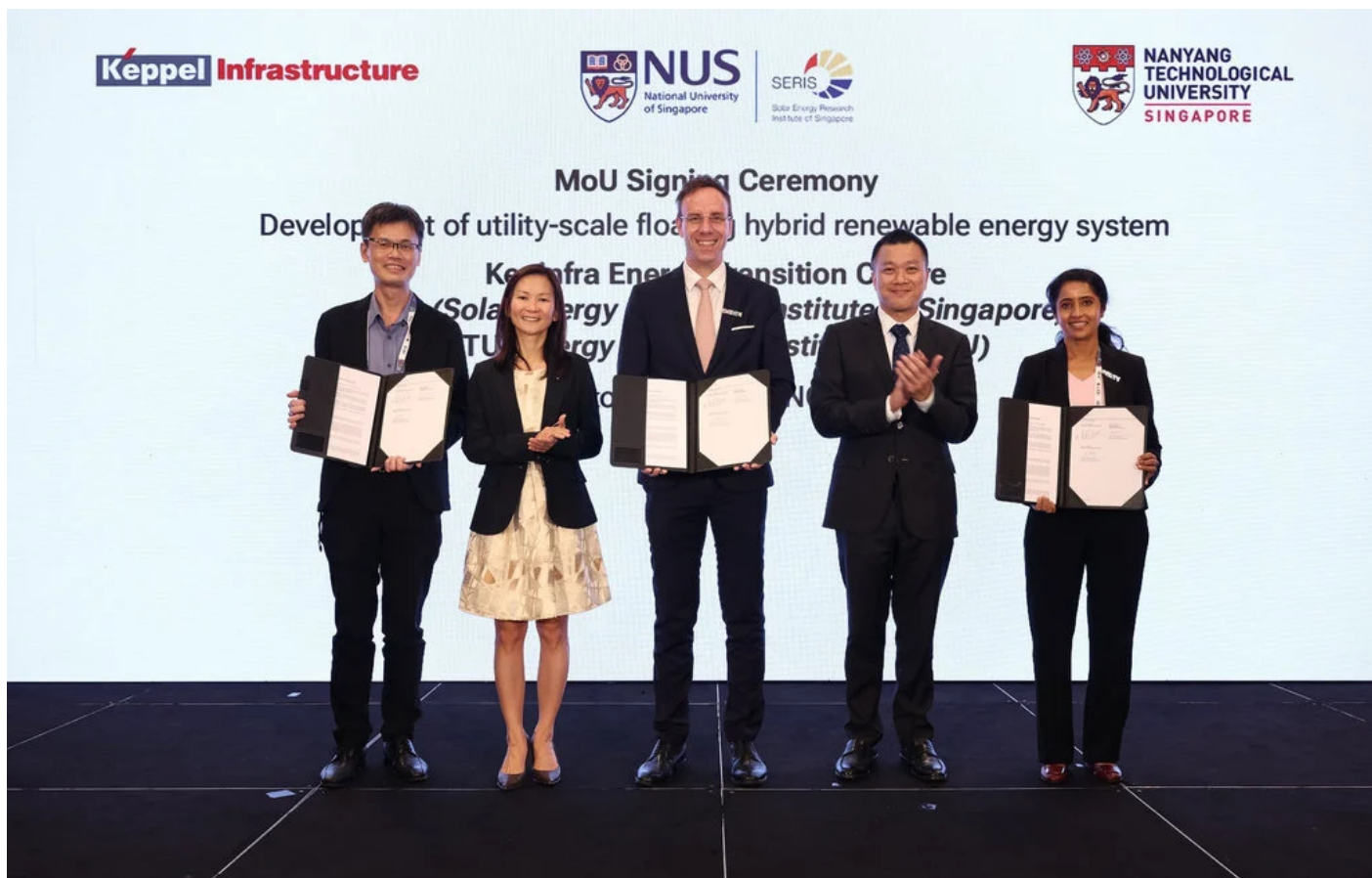


Singapore sets sights on utility-scale floating hybrid renewable energy system

BUSINESS DEVELOPMENTS & PROJECTS

October 28, 2022, by Amir Garanovic

Keppel Infrastructure, National University of Singapore (NUS), and Nanyang Technological University (NTU Singapore) have teamed up to explore the development of an offshore hybrid system which could harness solar, wind, and tidal energy for continuous power generation.



The signing of the MoU for the floating hybrid renewable energy system (Courtesy of SERIS)

The Singapore-based entities have signed a memorandum of understanding (MoU) for a joint-study on the technological and economic feasibility of developing a first-of-its-kind **floating hybrid renewable energy system** for operations off the Southeast Asian island country and city-state.

The MoU was signed by **Keppel**, through its applied technology innovation arm **Keppel Infrastructure Energy Transition Centre (KETC)**, **NUS**, through its **Solar Energy Research Institute of Singapore (SERIS)**, and **NTU Singapore**, through its **Energy Research Institute @ NTU (ERI@N)**.

The floating hybrid renewable energy system concept comprises modular offshore floating solar platforms with the flexibility to **integrate other renewable energy technologies**, such as **wave energy conversion systems**, **tidal energy turbines**, as well as **wind turbines**.

The study entails exploring the deployment of the system at a particular offshore test site in Singapore waters, subject to the relevant regulatory approvals.

If successful, the parties plan to design and deploy **a pilot system with at least 100MW of renewable power generation capacity** which could be scaled up over time. After implementing the novel system in Singapore, the aim is to roll it out to other regions in Asia and beyond, the partners said.

Cindy Lim, CEO of Keppel Infrastructure, said: *“We are pleased to embark on this joint study and co-creation of an innovative floating hybrid renewable energy system, to be deployed in suitable offshore locations around Singapore.”*

*“With limited land space in Singapore, moving into waters offshore presents opportunities to unlock the potential for more diversified renewable energy sources, thereby enhancing energy security and supporting Singapore’s transition to a **greener energy mix.**”*

Leveraging complementary strengths and capabilities of the three parties

Keppel Infrastructure will leverage its expertise in developing and operating energy and environmental infrastructure, electricity retailing, as well as the development of end-to-end low-carbon solutions including renewable energy systems.

SERIS and ERI@N will provide their know-how on the pontoon-based floating solar structure and its integration with other ocean renewable energy systems, as well as how to overcome the challenges of high wind and wave forces on the mooring and anchoring system, salinity on corrosion, and biofouling issues.

In addition, SERIS will provide expertise in design, component selection, implementation, and operation of the solar assets, while ERI@N will address tidal modelling with tidal flow conditions in the tropical belt of Singapore waters to assess power density.

Thomas Reindl, Deputy CEO of the SERIS, said: *“As one of the leading research institutes on floating solar worldwide, SERIS is very excited to provide its expertise to this novel approach of integrating floating solar with other renewable energy solutions.”*

*“We have been moving our research focus from in-land reservoirs to offshore structures quite some time ago and, given the limited sea space in Singapore, we need to utilize the same space twofold or even multiple times. If successful, **the proposed hybrid technology would also have great export potential.**”*

Madhavi Srinivasan, executive director of ERI@N, added: *“The deployment of renewable energy system in offshore conditions will face challenges such as environmental loads, biofouling and corrosion. We have a unique expertise and the necessary experience that will be critical in resolving such issues, gained from deploying tidal turbines in Singapore.”*

“Through this tripartite partnership, we hope to contribute our experience in hybrid renewable energy solutions and to advance this cutting-edge technology together with our partners.”

An offshore floating hybrid renewable energy system harnessing complementary energy sources such as solar, wind, and waves can provide continuous 24/7 power output, higher capacity factor and a lower levelized cost of energy (LCO) compared to single-source energy platforms, according to the partners.

It is also said to reduce the amount of marine space required, while increasing efficiency through the concurrent use of critical electrical infrastructures and combined operation and maintenance methodologies.