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For Immediate Release

LOCAL ORGANISATIONS COLLABORATE TO DEVELOP PROOF-OF-VALUE FOR FIRST-OF-ITS-KIND GREEN MODULAR DATA CENTRE SYSTEM

Singapore LNG Corporation Pte Ltd (SLNG), the National Supercomputing Centre (NSCC) Singapore, the National University of Singapore (NUS) and Surbana Jurong (SJ) have signed a Memorandum of Understanding (MOU), to collaboratively explore the development of a Proof-of-Value (POV) for a Green Modular Data Centre System, which would be the first-of-its-kind in Singapore, if proven feasible. The collaboration is in line with the global search for sustainable solutions to meet the growing demands for data centre rack space, as Singapore accelerates its digital transformation.

The concept is to install approximately one Petaflop of NSCC's supercomputer at the Singapore Liquefied Natural Gas (LNG) Terminal on Jurong Island, and use the Terminal's stable and continuous chilled seawater supply to reduce the heat generated. The chilled seawater is discharged as part of the Terminal's LNG regasification process that ensures a steady send-out of natural gas for the country's power generation needs. The project will also explore powering the prototype system with renewable solar energy or green power backup using hydrogen fuel cell, instead of a diesel power generation set. If the concept proves successful, the system has the potential to save 0.2 MW of power, roughly equivalent to a carbon footprint reduction of 700 tonnes per year, or carbon sequestered by around 11,575 tree seedlings planted and grown over 10 years[1].

The proposed design will make use of pre-fabricated, standard-sized containers to house the supercomputer, which will allow for a faster set up and installation, as compared to traditional data centre buildings. It will form part of the national research infrastructure that supports local research institutes, institutes of higher learning, and companies by providing the high-performance computing resources needed in various research fields. Examples of these research fields include weather and climate monitoring, genomics, engineering, offshore and marine, urban planning and biomedical science, among many others.

"SLNG is happy to have this opportunity to work with like-minded partners to explore, and possibly define, new solutions for the larger LNG Eco-system, such as this POV for a Green Modular Data Centre System, that will help further promote environmental sustainability. While SLNG remains committed to fulfilling and even exceeding our Energy Security mandate, we are also keen to do our part, especially where we can leverage on our LNG expertise and terminal infrastructure, to help catalyse new possibilities for a more sustainable energy future," said Mr Tan Soo Koong, CEO, SLNG.

"SLNG produces a huge amount of cold energy which is partially discharged as chilled seawater. We have the opportunity to tap on this excess cooling source instead of using more electricity to help cool our supercomputer and data centres," said Associate Professor Tan Tin Wee, Chief Executive of NSCC. "If successful, this prototype will demonstrate the value of industrial symbiosis, where one industry's waste can be converted into another industry's resource. By combining this with renewable

[1] Source: US EPA Website

energy such as solar power from photovoltaic farms, the novel concept could be a potential model for future green sustainable supercomputer data centres in Singapore."

Additionally, NUS will contribute its expertise in liquid cooling technology for the POV, and Surbana Jurong will leverage its engineering design expertise in new and renewable energies, low carbon technologies, cold energy harnessing and smart grid for the project.

Yeo Choon Chong, CEO, ASEAN, Surbana Jurong said, "Decarbonisation and improving increasing energy efficiency will continue to be Surbana Jurong's focus. This collaboration is a significant step towards finding a viable solution to meet the growing needs of Singapore's digital economic development, even as the country pursues green energy goals outlined in the Singapore Green Plan 2030. We are excited to collaborate with our partners to catalyse the development of green solutions utilising renewable energy, cold energy and low carbon emission technologies".

Associate Professor Lee Poh Seng from the Department of Mechanical Engineering at NUS said, "The increasing power demands from exponential digital growth has presented enormous challenges for the 21st century data centres. In this project, NUS will be deploying our patented high performance-cum-efficiency oblique-fin liquid and two-phase cooling technology, which are integrated to provide a complete cooling solution. This novel technology can reduce power consumption by about 40 to 50 per cent, and is specifically designed for high performance computing servers that populate the data centres. We are delighted to partner NSCC, SLNG and SJ in our joint mission to reduce power consumption and emissions. By leveraging our complementary knowledge and expertise, we can help drive sustainable data centre growth."

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Attachments:
1. Schematic of Green Modular Data Centre Proof-of-Value
2. Image of NSCC's **A**dvanced **S**upercomputer for **P**etascale **I**nnovation, **R**esearch and **E**nterprise 1 (ASPIRE 1), Singapore's first national petascale supercomputer system

About Singapore LNG Corporation Pte Ltd
Singapore LNG Corporation (SLNG) built, owns and operates Singapore's and Asia's first open-access, multi-user LNG terminal. It is a key infrastructure that supports the Nation's energy security strategy, and the development of the LNG industry in Singapore.

SLNG's primary mandate is to provide Throughput (Send-out) Services for the domestic market. Beyond this, SLNG also offers ancillary services such as Vessel Gassing-up & Cool-down, Storage & Reload (including for Small-Scale LNG), LNG Transhipment and LNG Truck Loading. SLNG will continuously seek to Catalyse New Possibilities in the Energy Transition.

For more information, please visit www.slng.com.sg

About the National Supercomputing Centre (NSCC) Singapore
The National Supercomputing Centre (NSCC) Singapore was established in 2015 to manage Singapore's national petascale facilities and high-performance computing (HPC) resources. As a National Research Infrastructure funded by the National Research Foundation (NRF), the HPC resources that we provide helps support the research needs of the public and private sectors, including research institutes, institutes of higher learning, government agencies and companies. With the support of our stakeholders, for example, the Agency for Science Technology and Research (A*STAR), Nanyang Technological University (NTU), National University of Singapore (NUS), Singapore University of Technology and Design (SUTD), National Environment Agency (NEA) and Technology Centre for Offshore and Marine, Singapore (TCOMS), NSCC catalyses national research and development initiatives, attracts industrial research collaborations and enhances Singapore's research capabilities.

For more information, please visit www.nscc.sg

About National University of Singapore
The National University of Singapore (NUS) is Singapore's flagship university, which offers a global approach to education, research and entrepreneurship, with a focus on Asian perspectives and expertise. We have 17 faculties across three campuses in Singapore, with more than 40,000 students from 100 countries enriching our vibrant and diverse campus community. We have also established our NUS Overseas Colleges programme in more than 15 cities around the world.

Our multidisciplinary and real-world approach to education, research and entrepreneurship enables us to work closely with industry, governments and academia to address crucial and complex issues relevant to Asia and the world. Researchers in our faculties, 30 university-level research institutes, research centres of excellence and corporate labs focus on themes that include energy; environmental and urban sustainability; treatment and prevention of diseases; active ageing; advanced materials; risk management and resilience of financial systems; Asian studies; and Smart Nation capabilities such as artificial intelligence, data science, operations research and cybersecurity.

For more information, please visit www.nus.edu.sg

About Surbana Jurong Group
Surbana Jurong Group is a global urban, infrastructure and managed services consulting firm, with over 70 years of track record in successful project delivery. Headquartered in Singapore, the group has a global talent pool of over 16,000 across Surbana Jurong and our member companies AETOS, Atelier Ten, B+H, KTP, Prostruct, RBG, SAA, Sino-Sun and SMEC, based in more than 120 offices in over 40 countries. They include architects, designers, planners, engineers and other specialists driven by progressive thinking and creative ideas to shape a better future.

Our technical experts deliver sustainable solutions that cover the entire project life cycle from planning and design, through to delivery and management, as well as decommissioning and closure. We provide a full suite of multidisciplinary consultancy services across a diverse range of sectors including aviation, healthcare, hospitality, transport, energy, water and the environment.

Surbana Jurong has built more than a million homes in Singapore, created master plans in more than 30 countries and developed over 100 industrial parks globally. Our tag line “Building Cities, Shaping Lives” expresses how every project or undertaking is, for the Group, an opportunity to fulfil aspirations and enrich lives. By designing and delivering quality housing, work spaces, roads, rail, hydropower, dams, underground and coastal protections and other critical infrastructure needed by our clients, we are redefining cities and transforming them into sustainable and liveable spaces where communities and businesses, present and future, can thrive.

For more information, please visit www.surbanajurong.com

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