



CITY DEVELOPMENTS LIMITED



PRESS RELEASE

NUS and CDL partner to develop novel technologies for smart, green living

S\$2.25m gift from CDL enables the setting up of two first-of-its-kind laboratories to test-bed building technologies in indoor and outdoor tropical environments

Singapore, 22 March 2016 – The National University of Singapore (NUS) School of Design and Environment and City Developments Limited (CDL) today announced their partnership in promoting innovations in smart, green building technologies. CDL made a gift of S\$2.25 million to the School to establish two new research laboratories dedicated to the study of smart building technologies for indoor and outdoor environments, and to provide funding for research projects. These initiatives, which are also supported by the Economic Development Board (EDB), will further entrench Singapore’s position as a leading international Smart City and improve the quality of life in our highly urbanised environment.

Mr Desmond Lee, Senior Minister of State, Ministry of National Development and Ministry of Home Affairs today officiated at the launch of two new programmes under the partnership: NUS-CDL Smart Green Home and NUS-CDL Tropical Technologies Laboratory (T² Lab) Programme. These new programmes are the first-of-its-kind tailored to the tropical climate.

Professor Heng Chye Kiang, Dean of NUS School of Design Environment, said, “We are deeply appreciative of the generosity of CDL and strong support of the EDB. We look forward to working closely with CDL and EDB to promote and deepen our efforts in developing sustainable solutions and technologies for smart, urban living that are suited for the tropical climate, hence benefitting Singaporeans as well as the local and regional building sectors.”

Mr Grant Kelley, CDL Chief Executive Officer, said, “In support of the national vision for a smarter, greener and more liveable Singapore, CDL is excited to collaborate with NUS on the NUS-CDL Smart Green Home and T² Lab, with EDB as our supporting partner. For over 20 years, CDL has championed leading-edge innovations in our projects to create impactful solutions and greater value for homeowners. CDL will continue to push boundaries to develop quality homes that are even more comfortable, resource-friendly and cater to a green and

smart lifestyle. We aim to add value to homebuyers by creating practical and crucial solutions to meet their energy, security, mobility and healthcare needs.”

“With CDL’s expertise in pioneering sustainable building innovations, we look forward to sharing our industry knowledge and carrying out pilot testing at our future developments. The capabilities developed by the two NUS-CDL platforms will also set new benchmarks for our building industry, as Singapore gears up to become a smart and sustainable nation.”

“Urban Solutions and Sustainability has recently been announced as a key technological domain to receive dedicated public research funding in the next 5 years. This research partnership between CDL and NUS is a prime example of how companies can work alongside government partners and institutes of higher learning to capture business opportunities in this exciting growth sector. We look forward to CDL and NUS co-developing, testing and exporting innovative sustainable urban solutions that are tailored for a rapidly urbanising tropical region,” Mr Goh Chee Kiong, Executive Director, Cities, Infrastructure & Industrial Solutions, EDB, said.

NUS-CDL Smart Green Home

This unique indoor test-bed environment will serve as a platform for researchers to undertake holistic and innovative experimental studies on smart features, green building technologies and design for sustainable living. The NUS-CDL Smart Green Home will be designed as a world-class venue for testing, analysing, evaluating and piloting rapidly evolving smart home innovations in a “plug-and-play” and in a real-life environment. It will also allow researchers to experiment with the technology-human interface.

The facility, expected to be completed by December 2017, will be located within a new building at the NUS School of Design and Environment and it will be managed by the School’s Department of Building. The NUS-CDL Smart Green Home is designed as a 100 m² full-size home. At least one facade will be designed for plug-and-play experimentation of new smart materials, systems and finishes.

The NUS-CDL Smart Green Home will be devoted to investigating human centred smart materials, technologies and knowledge platforms that lead to enhanced health and comfort, quality of life, and a sustainable and connected future.

One research project that will be carried out at this facility is to design and develop an intelligent system that is capable of improving indoor aural comfort by picking an ideal sound profile that is able to mask undesirable ambient noise. A library of desirable sounds will be selected to manage and reduce the undesired elements of different types of ambient noise. For example, well-blended and dosed insects’ sound and breeze may be used to mask road-tyre interaction noise and air turbulence noise created by fast travelling vehicles along expressway.

In another project, NUS researchers will design and develop novel facades and building envelopes that integrate smart nanomaterials and systems, sensor-based controls and analytics to continuously create an optimally balanced and

comfortable indoor environment that is appropriate for the occupants, and at the same time be energy efficient.

NUS-CDL T² Lab

The 107 m² NUS-CDL T² Lab is conceived as an adaptable indoor-outdoor research space that can be configured to test lifestyle scenarios, space-use configurations, features as well as cutting-edge or emerging technologies. Managed by the School's Department of Architecture, the laboratory will be used to study new ideas relating to research themes such as "healthy, green living" which explores the integration of passive and active building systems to achieve substantial reductions of carbon emissions, as well as "future lifestyles" which examines the adaptability of the Singapore home to ageing, safety and security, work-life balance, and social and cultural expectations.

The new laboratory, expected to be completed by December 2016, will be located on the NUS Kent Ridge campus. The lab will be constructed on an existing structure, and designed with flexibility to adapt to the new functions while testing high-performance materials and environmental systems.

One of the projects that will take place at this facility will be an experimental study on integrating building facade design, construction and operation that suit Singapore's climatic conditions. NUS researchers will study the integration of solar panels with building facades such as roof and vertical wall surfaces. For instance, they will evaluate the feasibility and efficiency of incorporating sun-shading shutters with solar membranes and panels.

Please refer to the [Annex](#) for more information on the two new research facilities.

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About National University of Singapore (NUS)

A leading global university centred in Asia, the National University of Singapore (NUS) is Singapore's flagship university, which offers a global approach to education and research, with a focus on Asian perspectives and expertise.

NUS has 17 faculties and schools across three campuses. Its transformative education includes a broad-based curriculum underscored by multi-disciplinary courses and cross-faculty enrichment. Over 38,000 students from 100 countries enrich the community with their diverse social and cultural perspectives.

NUS has three Research Centres of Excellence (RCE) and 26 university-level research institutes and centres. It is also a partner in Singapore's fifth RCE. NUS shares a close affiliation with 16 national-level research institutes and centres. Research activities are strategic and robust, and NUS is well-known for its research strengths in engineering, life sciences and biomedicine, social sciences and natural sciences. It also strives to create a supportive and innovative environment to promote creative enterprise within its community.

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

About NUS School of Design and Environment (SDE)

The National University of Singapore's School of Design & Environment (SDE) traces its roots back to 1958, when the Department of Architecture offered a five-year programme in the Singapore Polytechnic. From these humble beginnings, the School has grown into a world-class institution offering programmes in architecture, project and facilities management, real estate and industrial design.

From training professionals responsible for the building of the nation in its fledgling years of independence, to nurturing graduates equipped for the challenges of the future, the School provides an education which prepares its graduates to meet the current and future challenges of the design industry in relation to the built environment.

Building on the strength of its rich heritage and visionary leadership, the School is poised to remain at the forefront of global excellence in education and research.

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

About City Developments Limited (CDL)

City Developments Limited (CDL) is a Singapore-listed international real estate operating company with a global presence spanning 94 locations in 26 countries. As one of Singapore's largest companies by market capitalisation, its income-stable and geographically-diversified portfolio comprises residences, offices, hotels, serviced apartments, integrated developments and shopping malls, totalling over 18 million square feet of floor area globally. In Singapore, CDL has developed over 36,000 homes and is one of Singapore's largest commercial landlords, with one of the biggest landbanks amongst Singapore private-sector developers.

Having established its ethos of 'Conserving as we Construct' in 1995, CDL has been leading the industry with green building innovation from first-of-its-kind sustainable developments that inspire eco-friendly lifestyles to industry-changing methods that promote recycling, reduce waste and raise productivity. CDL is the first developer conferred the Building and Construction Authority (BCA) Green Mark Platinum Champion and Built Environment Leadership (Platinum) Awards. It has also achieved over 80 BCA Green Mark buildings and office interiors to date, the highest among Singapore developers. Globally, CDL remains the first Singapore corporation to be listed on three of the world's leading sustainability benchmarks - FTSE4Good Index Series (since 2002), Global 100 Most Sustainable Corporations in the World (since 2010) and Dow Jones Sustainability Indices (since 2011). In the Channel NewsAsia Sustainability Ranking 2015, CDL was named Top Property Developer in Asia, Top Singapore Corporation, and among the top 10 sustainable companies in Asia.

For more information on CDL, visit www.cdl.com.sg

Annex

NUS-CDL Smart Green Home



Artist's Impression

Total Floor Area: 100 m²

Targeted Completion: December 2017

The NUS-CDL Smart Green Home programme aims to harness research to develop innovative solutions to create homes that are safe and secure, healthy and comfortable, and acoustically pleasing.

The laboratory boasts of advanced research and education facilities to support a platform that is designed to create, experiment and implement technologies leading to a smart community and nation. The facility has a re-configurable structure to enable comparative research through flexible experimental setup, testing and monitoring. Some ideas that can be tested here include energy efficiency, quality of indoor environment and sustainable home of the future.

The facility also serves as a showcase to facilitate visits by students and industry collaborators.

NUS-CDL T² Lab



Artist's Impression

Total Floor Area: 107 m²

Targeted Completion: December 2016

This test-bed is designed and built to enable researchers to examine integrated technology solutions for people-centric, climate-responsive buildings of the future.

Possible studies that can be carried out at the facility include examining biomimicry building envelop devices and systems for harvesting of energy from renewable resources (such as sun, wind and daylight); solar control and shading; vertical and edible garden; solar chimney; and smart building materials. Researchers could also use the test-bed to explore how architecture and building design deal with extremities of weather, air pollution, and rising sea water levels.

In addition, designers and building scientists could also explore new ideas and concepts to innovate existing building designs to address environmental challenges that threaten liveability, comfort, well-being and health, especially in an intensified, compact urban environment like Singapore.