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NEWS RELEASE

**CapitaLand's Sustainability X Challenge 2022 unveils 10 finalists  
selected from over 340 entries from across 50 countries**  
*Innovations from CSXC 2021 testbedded at CapitaLand's properties in India,  
Singapore and the United States offer opportunities to scale globally*

**Singapore, 12 July 2022** – CapitaLand has unveiled 10 shortlisted innovations as finalists of its CapitaLand Sustainability X Challenge (CSXC) 2022, which has received overwhelming response of more than 340 entries from 50 countries. This far exceeds the over 270 entries from more than 25 countries received for its inaugural challenge last year. CSXC is the first global sustainability innovation challenge by a Singapore-based real estate company.

The 10 finalists from Singapore, Canada, China, India, Israel, South Africa, South Korea and USA will pitch their innovations at CSXC 2022 Demo Day on 20 July as they vie for a chance to pilot their projects at selected CapitaLand properties worldwide and win up to S\$50,000 each. Three special recognition award winners (High Impact Award, Most Innovative Award and Carbon Action Hero Award) will receive an additional S\$50,000 each. The prizes will go towards covering the cost of their pilots.

The 10 innovations<sup>1</sup>, categorised by CSXC's challenge statements, are as follows:

Low carbon transition

- The world's first glass-free, lightweight and flexible solar panel which is 70% lighter than typical solar panels and can be used on roofs that are unable to support conventional modules.
- A high-tech coating that uses sunlight to activate a cooling mechanism, effectively providing cooling without electricity and reducing energy consumption by up to 20%.
- A vertical-axis wind turbine that produces twice the energy of solar panels at a fraction of the size of the common horizontal axis turbines found in large wind farms.
- Smart louvres that reduce building energy dependency by up to 50% while producing up to 80% of rooftop solar power.
- A heating and cooling system that utilises a thermal battery made of phase-change material and artificial intelligence (AI) energy control technology to reduce energy consumption by 25-35%.

Water conservation & resilience

- A technology that helps to improve the efficacy of water meter readings, reducing businesses' water costs by up to 30%.

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<sup>1</sup> Data provided by CSXC finalists. More information on the projects can be found in Annex A.

- A chemical-free, automated, and low-energy solution for the treatment of cooling tower water that reduces blowdown water by up to 80%.
- An intelligent water leakage management platform that integrates high-precision acoustic sensors with AI, IoT, and cloud technology.

#### Waste management & circular economy

- A renewable energy system that can convert any combination of waste into onsite renewable electricity and thermal power while offsetting significant volumes of carbon dioxide.

#### Healthy & safe buildings

- A clean air system that uses sensors and active polarisation to provide buildings with High Efficiency Particulate Air (HEPA)-class air quality, while reducing energy consumption in buildings.

Ms Lynette Leong, who launched CSXC in 2020 and was recently appointed CapitaLand Investment (CLI)'s new CEO, Environment, Social & Governance (ESG) Funds & Stewardship, said: "Sustainability is a core tenet of CapitaLand's business, and we are committed to taking an active global leadership role in the transition to a climate-resilient built environment. Through CSXC and provision of sandboxes and funding for the piloting of technologies, we are helping innovators from around the world to accelerate their path towards commercialisation and industry adoption. From CSXC 2022's staggering submissions, we are encouraged by the increasing momentum in technological innovations globally towards solving climate change issues."

Mr Vinamra Srivastava, who succeeded Ms Leong as CLI's Chief Sustainability Officer on 1 July 2022, said: "Our CSXC initiatives, S\$50 million Innovation Fund and Smart Urban Co-Innovation Lab are pushing the boundaries of innovation to make a substantial, long-lasting impact for a better, more sustainable built environment. Eventually, we hope to see the large-scale implementation of some of these projects in our global portfolio to contribute to our ambitious sustainability targets in our 2030 Sustainability Master Plan and achieve Net Zero emissions by 2050."

#### Catch the finalists live at CSXC 2022 Demo Day on 20 July 2022

The 10 finalists will pitch their projects to an esteemed judging panel<sup>2</sup> comprising a global lineup of senior experts from Temasek, GGV Capital, Golden Gate Ventures, Singapore University of Technology & Design, Matrix Partners China, Rocky Mountain Institute and RSK Group at the CSXC 2022 Demo Day:

Date: Wednesday, 20 July 2022

Time: 2:30pm to 5:30pm (GMT +8)

Venue: The Big Picture, Level 9, Capital Tower, CapitaLand's headquarters in Singapore

Global live stream platforms: [CSXC website](#), and CapitaLand's [Facebook](#), [YouTube](#) and WeChat channels

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<sup>2</sup> Refer to Annex B for the list of judges

Guest-of-Honour: Dr Koh Poh Koon, Senior Minister of State for Sustainability and the Environment, and Manpower, Singapore

The 10 projects were shortlisted based on the impact, potential outcomes, depth of innovation, as well as scalability and effectiveness of deploying the solutions at CapitaLand's diversified assets across different geographies. The finalists have been paired with leading industry experts for a mentorship programme<sup>3</sup> to prepare them for their pitches.

Over 60 partners globally including firms and institutes in various sectors such as engineering, technology, venture capital, entrepreneurship, and trade, as well as country embassies, are supporting CSXC this year. The partners provide expertise and expand the reach of the challenge, amplifying its efforts to advance innovation and collaboration in sustainability within the built environment.

During Demo Day, a plenary session titled 'Transition to Net Zero in the Built Environment' will be held, where senior executives from Singapore-based global investor EDBI, and an investment platform company aimed at accelerating decarbonisation globally, GenZero will share their insights.

Register for the CXSC 2022 Demo Day [here](#).

#### Pilot projects from CSXC 2021

Seven projects, including the two winners, INOVUES, INC and Climatec Corp, from CSXC 2021, are currently being piloted at CapitaLand properties in India, Singapore and the USA. INOVUES, INC's insulating glass retrofitting technology which is being testbedded at Creekside 5 in Oregon, USA, is expected to reduce energy consumption by up to 40%. Climatec's unique water treatment process without chemicals is being piloted at CapitaGreen in Singapore.

Four innovations including an air duct sealing technology using airborne adhesive particles, a waterless self-cleaning technology for solar panels, a new generation bio water saving stick and an indoor air disinfection solution that aims to decrease virus survivability, are being testbedded at CapitaLand's various commercial, lodging and business park properties in Singapore and India. One pilot, a patented ceramic net which acts as an infrared emitting filter, has been successfully completed in Singapore.

#### Driving sustainability and innovation in the real estate sector

As a global sustainability leader in real estate, CapitaLand has been stepping up innovation to create a larger positive impact for the environment and society. CapitaLand launched a S\$50 million Innovation Fund in June 2021 to support the testbedding of sustainability and other high tech-innovations in the real estate sector for over five years. In 2020, it launched the Smart Urban Co-Innovation Lab (the Lab), Southeast Asia's first industry-led lab for smart city solutions development. The Lab has since engaged with over 700 companies across a

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<sup>3</sup> Refer to Annex B for information on the mentorship programme

wide range of industries to identify opportunities and co-create solutions for smart sustainable cities.

CapitaLand adopted district cooling systems in selected properties in Singapore and China. In 2021, CapitaLand was one of the pioneers to join Singapore's first brownfield distributed district cooling (DDS) network. Its Tampines Mall joined the DDS in April 2022, and Telepark is also a potential injection node for the network. CapitaLand has implemented an IoT platform which enables centralised monitoring and data analytics to optimise equipment performance at its properties in China, India and Singapore.

To measure the value created through its sustainability efforts, CapitaLand pioneered a proprietary return-on-sustainability metric that includes interest rate savings from its sustainability-linked loans and utilities cost avoidance. CapitaLand's continued leadership in sustainability and performance on renowned sustainability indices have allowed it to reap interest savings from its sustainability-linked loans. These financial savings are deployed to partly fund its sustainability innovation initiatives.

CapitaLand has been consistently recognised for its global sustainability leadership, including being part of prestigious rankings such as the 'Global 100 Most Sustainable Corporations in the World Index' and 'Dow Jones Sustainability World Index' for 10 years, as well as 'GRESB' for four years.

Find out more about CSXC at: <http://www.capitaland.com/csxc>

Read more about CapitaLand's sustainability initiatives at:  
<https://www.capitaland.com/international/en/about-capitaland/sustainability.html>

### **About CapitaLand Group ([www.capitaland.com](http://www.capitaland.com))**

CapitaLand Group (CapitaLand) is one of Asia's largest diversified real estate groups. Headquartered in Singapore, CapitaLand's portfolio spans across diversified real estate classes which include integrated developments, retail, office, lodging, residential, business parks, industrial, logistics and data centres. With a presence across more than 260 cities in over 40 countries, the Group focuses on Singapore and China as its core markets, while it continues to expand in markets such as India, Vietnam, Australia, Europe and the USA.

Within its ecosystem, CapitaLand has developed an integrated suite of investment management and operating capabilities that supports its real estate businesses and platforms in building core competencies across the real estate value chain. With this full stack of capabilities, CapitaLand can optimise the strategies of its listed real estate investment management business CapitaLand Investment, and its privately held property development arm CapitaLand Development; to drive competitive advantage for its businesses.

CapitaLand places sustainability at the core of what it does. As a responsible real estate company, CapitaLand contributes to the environmental and social well-being of the communities where it operates, as it delivers long-term economic value to its stakeholders.

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## **Annex A – The 10 finalists of the CapitaLand Sustainability X Challenge 2022**

### Low carbon transition

#### **Loh and Sons Paint Co (S) Pte Ltd (Singapore) in partnership with SolCold Ltd (Israel)**

- The Cooling Power of Sunlight - SolCold's innovative nano-technological material harnesses the sun's renewable source of energy to provide zero carbon emission cooling through its multiple cooling mechanisms. It cools surfaces more efficiently with Anti-Stokes Fluorescence technology and reduces the energy consumption required to cool the environment by up to 10%. SolCold can be used everywhere and anywhere under the sun that needs cooling. Singapore-based Loh & Sons Paint Co (S) Pte Ltd is partnering SolCold Ltd, an Israeli company, on research & development and commercialisation of SolCold products.

**Maini Renewables (India)** - Maini Renewables aims to carve out a new niche with a vertical-axis wind turbine designed for urban dwellings. Its turbines are small, customisable, and allow for greater energy production per unit of area compared with common horizontal axis turbines typically found in large wind farms. Their flagship product, the Chakra Turbine, produces two times more energy than solar and is able to use low-wind velocities as low as 1.5m/s in populated cities to generate power. Safety is paramount, and their turbines pose no danger to bird migration patterns, or wildlife, particularly if used in urban settings. Composed of lightweight materials, the turbine blades are durable and can withstand severe temperatures and wind conditions. Maini Renewables also reduces its waste footprint by designing its blades, generators, and drivetrain components to be 100% recyclable.

**Passive Edge Tech (China)** - Passive Edge Tech provides an energy-saving heating and cooling system using phase change material. Phase change materials are able to absorb, store and release a large amount of heat. Their solution, EDGE TCSS, utilises a thermal battery made of phase change material and artificial intelligence (AI) energy control technology to cut down energy consumption and carbon emission in the heating, ventilation and air-conditioning (HVAC) system. This can also reduce heating and cooling energy consumption by 25-35% and extend the HVAC lifetime by decreasing run time by up to 15-20%. Passive Edge Tech's technology can integrate thermal energy storage in buildings using a variety of methods, providing the flexibility to integrate a high share of renewable energy. It can fill the gap between energy supply and demand by absorbing excess energy in buildings, thereby making it a promising technology.

**Slide Luvre (South Africa)** - Intended as a solar energy solution for buildings with a lack of suitable roof space, Slide Luvre's smart voltaic louvres dramatically reduce building energy dependency on external sources by generating solar energy and saves energy by reducing cooling and artificial lighting needs. It significantly reduces peak daily and seasonal demand loads and can also be used in tandem with rooftop solar to improve early morning and late afternoon generation profiles. Energy-efficiency savings of up to 50% can be achieved, and it produces up to 80% of rooftop solar energy.

**Sunman Energy (China)** - Sunman Energy successfully commercialised the world's first glass-free, lightweight and flexible solar panel – the eArc, after conducting extensive research and development since 2014. The solar modules from Sunman Energy have no protective glass layer. Instead, they utilise patented composite materials in their panels, with a thickness

reduced to 2mm, a near-impossible feat for regular solar panel manufacturers. By considerably reducing the weight of typical solar panels by 70%, the 2.8 kg eArc can be used on roofs that are unable to support glass modules for static-related reasons, which is predominantly the case for most buildings. Sunman Energy's revolutionary eArc panels can be scaled up to cover large areas at a fraction of the weight, with significant returns.

#### Water conservation & resilience

**Ecoflow (Singapore)** – Ecoflow's proprietary WAVE Valve helps to improve the efficacy of water meter readings, reducing businesses' water costs by up to 30%. This is done without the use of power, downtime for the building, or compromising the end user's experience. The Valve can be inserted into any pipeline without any retrofit works. The technology compresses air bubbles present in the water pipeline, allowing the accurate (up to 30% lower) volume of water consumed to be reflected.

**Hydroleap (Singapore)** - Hydroleap's unique electrochemical technology (HL-EO) provides a chemical-free, automated and low-energy solution for the treatment of cooling tower water. HL-EO utilises an electro-oxidation process and generates hydroxyl radicals and free chlorine resulting in a reduction of conductivity, hardness, organics, and ions in the water. As a result, blowdown water can be reduced by up to 70-80%. The modularised design allows an easy and fast integration into any existing cooling towers as an in-line or side-line treatment process.

**WI.Plat (South Korea)** - WI.Plat solves the labour-intensive and painstaking problems typically faced during water leak detection processes. The company saves time and money typically spent on detecting leaks by using AI and innovative high-precision sonic acoustic sensors and integrates them into an intelligent water leakage management platform with IoT and cloud technology. Data-driven insights from the intelligent platform also include water pipe conditions, pressure change trends, and acoustic data patterns, among others. WI.Plat's solution does not require technical expertise, as the AI model identifies the leaks and showcases the data in the platform for analysis.

#### Waste management & circular economy

**Enexor BioEnergy (USA)** - Enexor BioEnergy's renewable energy system (Bio-CHP) can convert any combination of organic, biomass, or plastic waste into onsite renewable electricity and thermal power while offsetting significant volumes of carbon dioxide. The company saves most customers at least 20-30% on their current energy and waste disposal costs while concurrently enabling them to become more sustainable with zero upfront CAPEX required as Enexor offers its systems via its novel Energy-as-a-Service model.

#### Healthy & safe buildings

**CleanAir.ai (Canada)** - CleanAir.ai's ALVI CleanAir Safety System™ (patent pending) uses sensors and active polarisation to provide buildings with HEPA-class air quality. The system removes harmful microparticulate (less than 0.007 microns) such as viruses, volatile organic compounds (VOCs), bacteria, and mold spores from the air, resulting in a more enjoyable and safer indoor environment. ALVI CleanAir Safety System™ uses sensors and IoT to connect to leading building automation systems to notify the users of air quality events and real-time

filter status. Additionally, it uses a low-pressure drop filter that reduces energy consumption in buildings while reducing HVAC maintenance costs.

**Annex B – The judging panel and the mentorship programme of the CapitaLand Sustainability X Challenge**

The 10 finalists have been mentored by leading industry experts from CapitaLand and the CSXC 2022 partners to refine their proposals and prepare them for the final pitch to a distinguished panel of judges at CXSC 2022 Demo Day on 20 July 2022.

Mentors from CapitaLand help deepen the finalists’ understanding of CapitaLand’s operations and its sustainability requirements and aims, while also identifying opportunities to scale their innovations within the CapitaLand portfolio.

External mentors work with the finalists to sharpen their business plans, product positioning and enhance their understanding of the industry.

<b>Judging Panel</b>	<b>External Mentors</b>
<ul style="list-style-type: none"> <li>• <b>Mr Rohit Sipahimalani</b>, Chief Judge of CSXC 2022, Chief Investment Officer and Head, South East Asia, Temasek</li> <li>• <b>Professor Cheong Koon Hean</b>, Practice Professor &amp; Chair of the Lee Kuan Yew Centre for Innovative Cities (Singapore University of Technology &amp; Design) &amp; Chair of the Centre for Liveable Cities’ Advisory Panel (MND)</li> <li>• <b>Mr David Su</b>, Founding Managing Partner of Matrix China and Non-Executive Independent Director of CapitaLand Investment</li> <li>• <b>Ms Huey Lin</b>, Venture Partner, GGV Capital</li> <li>• <b>Mr Jeffrey Paine</b>, Co-founder &amp; Managing Partner of Golden Gate Ventures</li> <li>• <b>Dr Jon Creyts</b>, Managing Director and Chief Program &amp; Strategy Officer, Rocky Mountain Institute</li> <li>• <b>Ms Lucy Thomas</b>, Chief Scientist of RSK Group, Managing Director of RSK’s Centre for Sustainability Excellence in Singapore &amp; RSK’s operations in Africa</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Mr Adam Sack</b>, Co-founder of Asia Sustainability Angels, and Chief Investment Officer of IFC Asset Management Company</li> <li>• <b>Mr Dwayne Kaan</b>, Program Manager for RealTechX, Taronga Ventures</li> <li>• <b>Mr Keith Morrison</b>, Director, Marketing &amp; Communications of Black &amp; Veatch</li> <li>• <b>Mr Mark Hurst</b>, CEO of HurstX Solution</li> <li>• <b>Mr Mark Inkster</b>, Co-founder of Asia Sustainability Angels</li> <li>• <b>Mr Nitin Jain</b>, Co-founder of Grow Asia</li> <li>• <b>Ms Ruoyao Zhang</b>, Analyst at SOSV</li> <li>• <b>Mr Steve Melhuish</b>, Founding Partner of Wavemaker Impact &amp; Co-founder and Board Director of PropertyGuru Group</li> <li>• <b>Mr Toon Suan Wong</b>, Executive Advisor at NUS Enterprise, Board of Directors at Beijing Gas Group Singapore Ptd Ltd &amp; Founder &amp; Managing Director at ONEBlue Advisory LLP</li> <li>• <b>Mr Vivek Kumar</b>, Chief Marketing Officer at WWF-SG</li> </ul>