Green Pulse

A Publication from **Green In Future Pte Ltd**, Singapore

Volume 10 Issue 42 • 2026 • www.greeninfuture.com

Temasek Shophouse Showcases New Outdoor Community Space as part of Holistic Heritage-led Sustainability Design

INSIDE

GreenPulse
VOLUME: 10
ISSUE: 42

Credits:
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INTRODUCTION

The world is in our hands.

This International Women's Day, let us recognise the vital role played by the women farmers and rural leaders in building resilient food systems and advancing climate action. Because what we do today, as green champions for women and our Mother Earth, will define the legacy we leave behind.

Aligned with the global theme of empowering women in agriculture and sustainability, Green In Future supports efforts that create awareness, change attitudes, and accelerate adoption of sustainable solutions.

Happy International Women's Day!

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Temasek Shophouse Showcases New Outdoor Community Space as part of Holistic Heritage-led Sustainability Design

● *On track to become Singapore's first heritage shophouse to achieve BCA Green Mark Platinum Zero Energy certification, demonstrating how heritage buildings can be adapted to meet current and future environmental and social needs*

● *Suite of integrated sustainability features across the shophouse contribute to up to 47% energy savings, an achievement for a conserved building*

● *Refreshed outdoor space will open to the public from 14 March; support biodiversity and reflect Singapore's "City in Nature" vision*

View of the Outdoor Community Space at Temasek Shophouse. Image © Darren Soh

Social impact hub **Temasek Shophouse** (TSH) will open its new outdoor community space to the public on 14 March, supporting biodiversity while creating accessible spaces for environmental learning and public participation. It reflects Singapore's broader vision to further restore nature into the urban environment and transform Orchard Road into a greener and more family-friendly lifestyle destination. This marks the completion of a multi-year transformation that integrates heritage-led sustainability and community engagement.

The transformation is guided by TSH's holistic sustainability framework, which shaped how the entire site - both indoor and outdoor spaces - could be adapted to meet contemporary environmental and social needs while preserving its historic character. Features such as solar panels, hybrid cooling

systems, energy-efficient lighting, rainwater harvesting systems, pollinator-friendly native plants and a community farm demonstrate this integrated approach.

“With our transformation now complete, we are better positioned to support changemakers and deepen public engagement in social and environmental impact,” said **Ms. Yvonne Tay, Chief Executive Officer, Temasek Shophouse.** “The enhanced Temasek Shophouse will allow us to test and refine sustainable urban design concepts within a conserved heritage setting. This milestone reflects the collective effort of our like-minded partners and designers, and we remain committed to learning and strengthening our approach over time.”

A Testbed for Sustainable and Regenerative Design

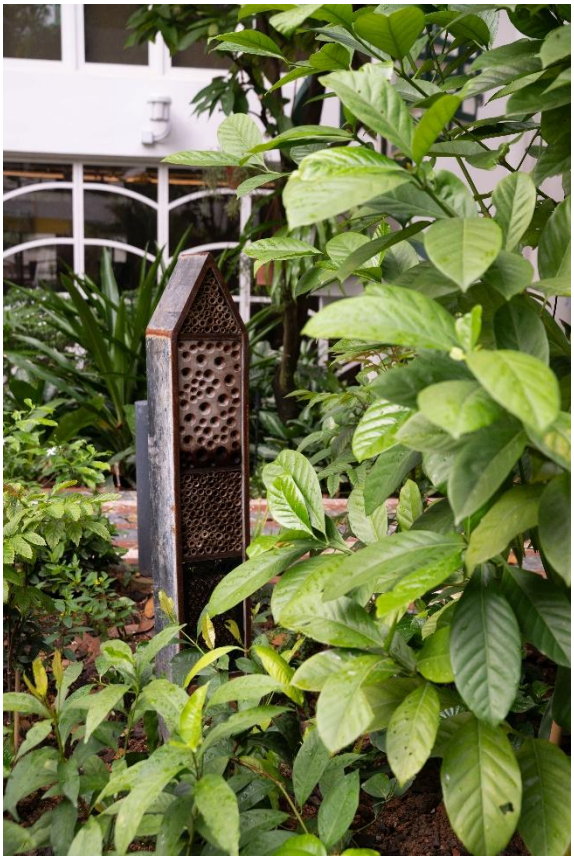
TSH’s **Sustainability Framework** is developed in consultation with SJ Group’s Sustainability & Resilience Office and environmental design consultancy Atelier Ten, a member company of SJ Group. The framework encompasses seven pathways to achieving holistic sustainability – Optimised Energy Performance; Climate Resilience; Landscape & Biodiversity; Holistic Water Management; Health & Wellbeing; Material & Resource Circularity; and Inclusive & Supportive Community *(Refer to factsheet for more details)*.

It also takes into consideration recognised local and international benchmarks that promote high energy performance and low-carbon operations; sustainable building design and resource efficiency; occupant health and wellbeing; and responsible waste reduction and circular practices. These efforts have placed TSH on track to become Singapore’s first heritage shophouse to achieve the BCA Green Mark Platinum Zero Energy certification and the International WELL Building Institute WELL Certification (Platinum).

A key priority was adaptive reuse — carefully retaining the original shophouses’ architecture while retrofitting the existing structures, significantly reducing embodied carbon and construction waste. Solar panels offset part of the building’s energy demand, while rainwater is harvested to reduce

potable water use. A hybrid cooling system, coupled with ceiling fans and CO_2 sensors, continuously monitors the occupancy and indoor air quality, allowing airflow and cooling to adjust in real time, maintaining comfort without wasting energy. With these features in place, TSH is expected to achieve up to **47% energy savings**, exceeding the current Singapore Super Low Energy standard of 40% energy savings, a notable achievement for a heritage building with conservation constraints.

"Every solution had to be precise to meet sustainability goals, with the outdoor community space designed to be just as significant as the building itself from the onset," said **Ms. Naree Phinyawatana, Director, Atelier Ten (a member company of SJ Group).** "Under a holistic sustainability framework, the outdoor space and conserved shophouse are designed to support strong community interaction, strengthen the relationship with nature and improve energy efficiency. Aligned with recognised international benchmarks and on track to achieve BCA Green Mark Platinum Zero Energy, Temasek Shophouse plays a regenerative role by creating positive environmental and social value, paving the way for how conserved buildings can evolve responsibly and offering a reference point for heritage projects globally."



Beyond building performance, the framework also guides the design of outdoor space to integrate nature into daily experience for the community. In collaboration with design firm Henning Larsen, TSH developed a landscape vision that supports biodiversity, climate resilience and community use.

Courtyards have been reimagined as green social spaces, while mature trees on site have been preserved. Timber from older or diseased trees have been repurposed into furniture and fixtures, reducing material waste. Across the outdoors, fully native planting was prioritised to support biodiversity and ecological resilience. The landscape design also incorporates elements that support rainwater management, while creating usable community space. Wall murals along the canal connect the site's heritage to its future, reinforcing TSH's role as both a conserved landmark and a forward-looking social impact hub.

"Temasek Shophouse presented an opportunity to explore how heritage spaces can contribute meaningfully to a regenerative urban future," said **Ms. Jia Xin Chum, Studio Director, Henning Larsen.** "Together, we sought to integrate biodiversity, climate resilience and community life into the landscape in a way that feels both natural and purposeful. We believe projects like this demonstrate how cities can evolve responsibly – strengthening their environmental performance while actively engaging the community."

Partnerships Enabling Practical Decarbonisation and Community Engagement

TSH's sustainability efforts are bolstered by strategic partnerships with organisations such as **Sembcorp** and **Fullerton Fund Management**.

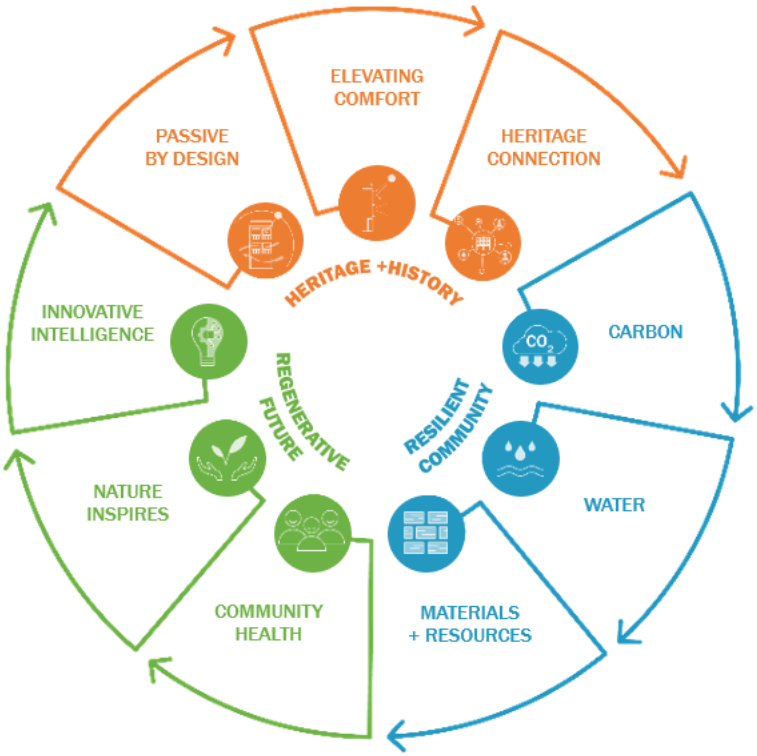
TSH's multi-year partnership with Sembcorp focuses on applying decarbonisation solutions across its premises. Drawing on Sembcorp's capabilities in renewable energy and decarbonisation, the collaboration will support TSH's endeavours in demonstrating how heritage community spaces can integrate real and meaningful sustainability practices to reduce the carbon footprint of day-to-day operations.

In addition, the community farm by Fullerton Fund Management at TSH will engage the wider community to embrace sustainable living through greater awareness of local produce and mindful consumption. Through workshops, community farm tours, regular Farmers' Markets, and an upcoming farm-to-table experience with Bibik Violet featuring produce from the community farm, the public are invited to connect, learn, and support local producers, in line with Singapore's food resilience ambitions.

Originally built in the early 1900s, the shophouses that form TSH were once home to heritage landmarks such as the Malayan Motors showroom and Midfilm House. Their conservation preserves an important part of Singapore's architectural legacy, while their adaptive reuse demonstrates how heritage buildings can meet modern sustainability standards.

Overview of Holistic Sustainability Framework

This Holistic Sustainability Framework was created in collaboration with SJ Group's Sustainability & Resilience Office and environmental design consultancy Atelier Ten, a member company of SJ Group.



Heritage + History

Passive by Design - Maximising daylight access and passive spatial design inspired by the original architectural features of the conserved shophouses to enhance indoor environmental quality while preserving heritage character.

Elevating Comfort — Optimising thermal and visual comfort through hybrid cooling systems, efficient lighting, and high-performance building systems to create comfortable and productive shared spaces.

Heritage Connection — Creating an inclusive and equitable platform that

Resilient Community

Carbon – Supporting low-carbon operations and reduced operational energy use, with a roadmap towards improved energy performance and carbon reduction.

Water — Managing water responsibly through rainwater harvesting and efficient water use strategies. x

Materials & Resources — Sourcing sustainable and environmentally responsible materials and promoting waste reduction practices during construction and operation.

Regenerative Future

Community Health – Establishing healthier workplaces and collaborative gathering spaces that catalyse synergy and embrace social cohesion

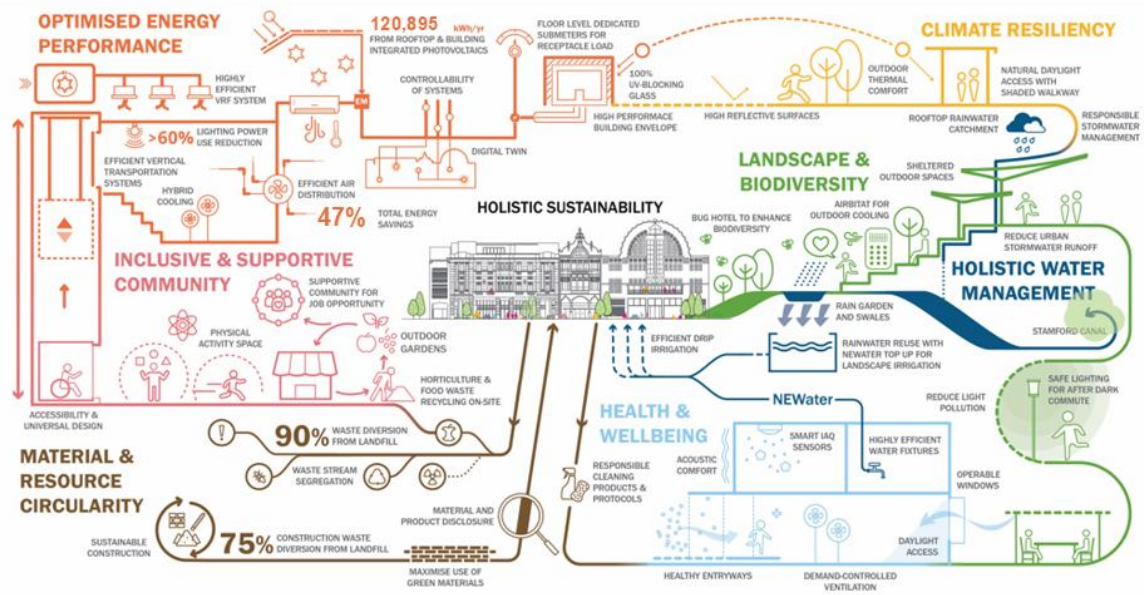
Inspired by Nature — Integrating nature-based solutions and promoting biophilic health to enhance and encourage connections between indoor environments and natural ecosystems.

Innovative Intelligence — Leveraging smart building technologies and digital monitoring systems to improve building performance, energy

engages collaborators and collects ideas to foster innovation for future generations.

efficiency, and operational optimisation.

Holistic Sustainability Framework in Action



The Holistic Sustainability Framework is organised around 7 key pathways and informs the features integrated across the building and its outdoor spaces:

1. **Optimised Energy Performance –**

i. **Hybrid cooling system:** Combines ceiling fans with air conditioning to enhance air movement and allow higher temperature setpoints without compromising thermal comfort

ii. **Integration of solar photovoltaic panels:** Supported through a multi-year partnership with Sembcorp to apply decarbonisation solutions across the premises

iii. **Active systems:** Energy-efficient lighting, demand-controlled ventilation using CO_2 sensors, and smart building management systems

With these features in place, TSH is expected to achieve up to 47% energy savings, exceeding the current Singapore Super Low Energy standard of 40% energy savings.

TSH is also on track to become Singapore's first heritage shophouse to achieve the BCA Green Mark Platinum Zero Energy certification.

2. **Climate resilience –**

i. **Shaded outdoor walkways and reflective surfaces:** Reduce heat gain, helping to reduce heat build-up around the building and reduce cooling load requirement.

3. **Landscape and Biodiversity –**

i. **Nature-based systems:** Water, shade, planting and airflow are designed as integrated environmental systems

ii. **Biophilic design for people:** Connecting people everyday to nature to support comfort, wellbeing and social interaction

iii. **Climate-responsive outdoors:** Nature-led strategies to manage heat, rain and microclimate across TSH, a dense, urban site. The outdoor space integrates Airbitat, an innovative cooling

system that uses one-quarter the energy of traditional air-conditioning, helping the outdoor community space to remain comfortable.
iv. **Urban biodiversity embedded:** Habitats and ecological continuity woven into the public realm
v. **Designed to evolve over time:** Spaces that adapt through use, stewardship and learning

4. **Holistic Water Management –**
i. **Rainwater harvesting system**: Collects and stores rainwater for non-potable uses such as landscape irrigation. The system is complemented by water-efficient fixtures and responsible water management practices to reduce potable water demand and support more sustainable building operations.
ii. **Climate Stone:** Permeable pavement that allows rainwater to seep through to the ground and channelled to the TSH rain garden for reuse. TSH is the first in Singapore to pilot this innovation.
iii. **Rain Garden:** A landscape feature designed to collect and temporarily hold rainwater. Collected rainwater is filtered through aquatic habitats and drained into the rainwater harvesting tank, before being used for irrigation in the garden.

5. Health and Well-Being –
i. **Movement:** Active design, walkability, and mindful eating
ii. **Biophilic outdoor:** The outdoor spaces integrate greenery and nature-based design to strengthen connections between people and the natural environment. Native planting and pollinator-friendly gardens support biodiversity, while preserved mature trees and landscaped courtyards create welcoming spaces for community gatherings along Stamford Canal and Handy Green.
iii. **Air:** Indoor environments are supported by a hybrid cooling system that combines air conditioning with ceiling fans to improve air movement and reduce energy consumption. Demand-controlled ventilation using CO_2 sensors helps maintain good indoor air quality by adjusting airflow based on occupancy levels.
iv. **Water**: Rainwater harvesting systems collect and store rainwater for non-potable uses such as landscape irrigation. Together with water-efficient fixtures and responsible water management

practices, these measures help reduce reliance on potable water and support more sustainable building operations.

v. **Material sourcing, optimisation, and management:** Sustainable material strategies guided both the design and construction phases. These include the use of environmentally responsible materials, efficient structural design to minimise material use, and construction waste management practices that diverted a significant portion of waste from landfill. Timber from older or diseased trees on site has also been repurposed into furniture and fixtures.

vi. **Thermal environment:** Passive design strategies and efficient cooling systems help maintain comfortable indoor environments while minimising energy use. The hybrid cooling approach allows for higher temperature setpoints while maintaining occupant comfort, supported by improved air movement and responsive building systems.

vii. **Visual comfort:** The building maximises natural daylight through the original architectural features of the conserved shophouses, reducing reliance on artificial lighting during the day. Energy-efficient lighting systems further enhance visual comfort while supporting overall energy efficiency.

These efforts have placed TSH on track to achieve the International WELL Building Institute WELL Certification (Platinum).

6. Material and Resource Circularity –

i. **Adaptive reuse:** In preserving conserved shophouse façades and key architectural elements, as well as the use of sustainable material strategies, TSH is able to significantly reduce demolition waste and embodied carbon associated with new construction – diverting 75% of waste from landfill

ii. **Waste management strategies:** For daily operations like food, paper, horiculture will help to divert 90% of waste from landfills

iii. Responsible waste management and reduction: Incorporated in day-to-day operations is reflected in its ongoing efforts to be True Waste certified.

7. Inclusive and Supportive Community -

i. **Ease of movement across the site**

ii. **Accessibitlity to transit network:** Located within walking distance major public transit nodes improving, accessibility for visitors and the wider community.

iii. **Accommodating and accessible seating** A variety of seating areas throughout the site support rest, social interaction, and community gatherings.

iv. **Inclusive, universal design** Thoughtfully designed spaces such as levelling out the floors of the different blocks with gentle ramps to ensure the site is welcoming and usable for people of different abilities.

v. **Intuitive wayfinding** Clear spatial organisation such as through colour coding of the different blocks help visitors easily navigate the building and surrounding spaces.

vi. **Supportive walkability** Through the Stamford Canal decking which provides comfortable pedestrian access connecting Orchard Road to Handy Green.

These aspects also make up what is included in the WELL and LEED certification requirements.

Yvonne Soh

Ms Yvonne Soh currently serves as the CEO of Singapore Green Building Council (SGBC). She graduated with a Bachelor of Engineering (Civil) from NTU and subsequently obtained her Master of Science (Civil Engineering) degree from NUS and Master of Business Administration from Murdoch University.

She gained her industry experience as a civil engineer at an international multi-disciplinary consultancy firm, before joining the Building and Construction Authority (BCA), where she headed the Centre for Sustainable Buildings and managed portfolios in policy development, regulatory & licensing control, industry promotion, and research & development. Ms Soh is Deputy Chair of the Singapore Accreditation Council (SAC), Chair of SAC Council Committee for Certification, and a member of Enterprise Singapore's Standards Committees for Building Construction and Environment & Resources standards. She was also recently appointed to ACRA's Interim Sustainability Standards Committee.

SGBC is known for advocating sustainable transformation in the built environment and this includes all stakeholders. What are the steps SGBC is taking to support suppliers, especially the SMEs, in understanding embodied carbon reporting and improving performance?

SGBC's mission is to harmonise sustainability efforts across the built environment value chain, ensuring that individual actions are amplified through a unified industry approach.

Recognising that embodied carbon is an emerging field with global data gaps, we have collaborated with key partners to roll out a number of essential reporting resources. This includes the building materials and mechanical & electrical equipment carbon calculators - developed by the NUS Energy Studies Institute and commissioned by JTC with BCA and SGBC's support. To complement the database of carbon emission factors, SGBC developed a standardised reporting guide to provide the industry with a consistent methodology for reporting building emissions.

Beyond tools, SGBC has also been ramping up education efforts to raise the level of knowledge across the industry. Through a suite of webinars, seminars and technical courses, we are equipping SMEs and professionals with the skills to utilise the carbon calculators and interpret complex carbon data effectively.

The recently launched Concrete Data for Concrete Action report is a milestone for Singapore's built environment. What, according to you, are the most significant findings from this study? Why is it critical to establish a market-wide embodied carbon benchmark in the current climate?

For over a decade, SGBC has championed a market-led approach to greener and healthier building materials through the Singapore Green Building Product (SGBP) certification scheme. This study validates that industry players are proactively selecting lower-carbon concrete even in the absence of a regulatory mandate. This leadership is most pronounced in the volume-weighted average carbon emissions of the grade of concrete that is most commonly used across Singapore's construction landscape. Embodied carbon has historically been more difficult to address than operational carbon because it is embedded upstream in materials, supply chains and procurement decisions. This

study provides the critical market-level baseline and transparency needed for the industry to drive its own decarbonisation. These findings will also allow us to calibrate our 1-to-4 tick certification bands, strengthening the SGBP scheme as the foundation for coordinated action across the industry, from building developers and specifiers to concrete suppliers.

Are there encouraging innovations in the sphere of low carbon cement substitutes, alternative binders, carbon capture technologies, or digital carbon tracking tools?

We are seeing encouraging innovations across the concrete and cement value chain. As highlighted in the Built Environment Decarbonisation Technology Roadmap recently launched by BCA and SGBC, low carbon concrete is a cornerstone of embodied carbon reduction strategy. This can be achieved through three key pathways: reducing cement reliance via specialty additives, utilising alternative raw materials for concrete production, and pioneering carbon-injection technologies during production. Supporting these physical innovations are digital carbon tools. These tools help the industry to take a data-driven approach, allowing project teams to quantify carbon at the design stage and manage whole-life carbon as a strategic asset.

Could this Singapore benchmark serve as a model for other cities in Southeast Asia? How might it shape broader regional decarbonisation efforts?

The primary driver of concrete's carbon footprint is cement—a material Singapore imports in its entirety, primarily from our Southeast Asian neighbours. The Singapore benchmark serves as a strong market signal; by defining procurement trends, we provide regional cement producers with the clarity and confidence to invest in low-carbon innovations and alternative materials.

As many Southeast Asian nations look to their domestic cement sectors to meet national decarbonization goals, Singapore's lead demand can act as a catalyst for coordinated regional action. We have often played a convening role in advancing sustainability standards in the region. If similar benchmarks are adopted regionally, it will not only accelerate material innovation but also significantly improve data comparability for green financing. Ultimately, decarbonising the concrete supply chain requires systemic change, and this benchmark provides the common language to drive that change at scale.

Singapore's first market-wide carbon benchmark for concrete launches to support built environment decarbonisation

- *Developed by CapitaLand Development and Climate Group's ConcreteZero initiative, Singapore's first market-wide carbon benchmark gives the industry data to identify and choose lower-carbon options.*
- *The benchmark supports faster concrete decarbonisation in a sector responsible for 8% of global carbon dioxide emissions.*
- *The methodology can be replicated across Asia and globally, positioning Singapore as a blueprint for decarbonising concrete in construction markets.*

CapitaLand Development and Climate Group's ConcreteZero initiative launched on 26th February 2026, the *Concrete Data for Concrete Action* benchmark, Singapore's first market-wide reference for examining the carbon footprint of concrete. The benchmark establishes a credible baseline for the embodied carbon intensity of concrete supplied in Singapore, giving the construction value chain a single, shared starting point for the first time.

Developed through collection and analysis of verified environmental data from concrete suppliers, the benchmark represents a weighted average of embodied carbon performance across commonly used concrete mixes.

With the benchmark as a shared rulebook, the value chain is able to identify and choose lower-carbon concrete options. It aligns stakeholders across the built environment on reducing embodied carbon emissions together.

Panel 1 – L-R Giovanni Cossu, Head of Sustainability, CapitaLand Development. Yvonne Soh, CEO, Singapore Green Building Council (SGBC). Prof. Pang Sze Dai, Associate Professor, Department of Civil & Environmental

This transparency empowers demand and supply-side industry stakeholders to make informed decisions, while providing policymakers with the additional data to support standards across public and private projects.

This alignment is urgently needed. The built environment accounts for almost 40% of global carbon dioxide emissions, with concrete alone accounting for 8%. By equipping developers, suppliers, regulators and financiers with a common reference point, the benchmark accelerates the transition from isolated pilot projects to systematic market adoption, reducing embodied carbon in construction at scale.

As Singapore imports most of its construction materials, the benchmark's findings extend beyond the city-state, facilitating the wider Asian supply chain transition towards sustainable developments. The report draws on frameworks from the UK and Australia, adapted for Singapore's market to ensure the data is internationally robust and regionally relevant.

Mike Pierce, Executive Director, Systems Change at Climate Group, says:

"Singapore's embodied carbon benchmark is a critical step forward for Southeast Asia's built environment. As the country's first standardised measurement framework for concrete, it gives industry the transparency needed to make informed decisions about low-carbon materials. This exemplifies how government-industry collaboration can accelerate the transition to net zero construction and provides a clear and replicable model for other countries to follow."

Tony Tan, Chief Corporate Officer at CapitaLand Development, says:

"Developing high-quality spaces that support construction decarbonisation begins with making responsible choices at every stage, including what we build with. This benchmark provides the market with a reference tool to recognise and value low-carbon concrete. By aligning developers, suppliers, financiers and policymakers around shared data, it accelerates adoption at scale and helps buyers and investors identify buildings that will remain competitive as sustainability standards rise. This is what building for the long term looks like in practice to CapitaLand Development."

Tan Chee Kiat, Deputy CEO for Industry Development at the Building and Construction Authority, says:

"The findings from this industry-led study signal Singapore's success in adopting low-carbon concrete. These insights will provide a roadmap for our stakeholders as they transition towards low-carbon developments. I am heartened to see our collective efforts in embodied carbon, supported by carbon management initiatives like the Singapore Building Carbon Calculator and the Green Mark Whole Life Carbon badge, delivering an impact on our built environment."

Andrew Minson, Director Concrete and Sustainable Construction at Global Cement and Concrete Association (GCCA), says:

"The GCCA concrete carbon ratings developed with UNIDO IDDO are designed to be used with local data, and so we enthusiastically welcome the work to establish the current embodied carbon of concrete in Singapore classified by strength. Local current data with global static ratings is the foundation for consistent low-carbon procurement to send meaningful design signals for suppliers."

Yvonne Soh, Chief Executive Officer at Singapore Green Building Council, says:

"The concrete benchmark validates Singapore Green Building Council's long-standing efforts in market transformation for sustainable products. By quantifying baseline emissions across the various concrete strength grades, we can now accelerate the transition to low-carbon concrete with greater strategic purpose and evidence-based action."

Financing the Future of Food: How Sustainable Finance is Transforming Asia's Agribusiness Sector

As climate pressures, supply chain disruptions, and biodiversity loss increasingly threaten global food systems, the financial sector is stepping up to support a more sustainable agricultural transition. In Asia—home to some of the world's most complex and vulnerable food supply chains—new financing frameworks are emerging to help businesses shift toward climate-smart agriculture and resilient food production.

One such initiative comes from United Overseas Bank (UOB), which has developed a Food and Agribusiness Sustainable Finance Framework aimed at accelerating sustainability across the entire food value chain.

A Regional Approach to Sustainable Food Systems

Headquartered in Singapore, UOB operates across major markets in Asia and has been positioning itself as a partner for industries navigating sustainability transitions. The bank's framework focuses specifically on the consumer goods and agribusiness sectors, recognising that food production—from farming to processing and distribution—plays a crucial role in climate mitigation and resource management.

The framework is designed to align financing with the global sustainability agenda, including the goals of the United Nations Sustainable Development Goals (SDGs). By integrating environmental, social and governance (ESG) considerations into lending and investment decisions, the initiative aims to support businesses that are adopting greener production methods.

Six Key Themes for Sustainable Agriculture

The framework identifies six priority areas where financing can help drive sustainable transformation across the agrifood sector.

Climate-smart agriculture sits at the core, supporting farming practices that improve productivity while reducing environmental impact. These include soil management, resilient crop systems, and technologies that help farms adapt to changing climate conditions.

Another key area is alternative food production technologies, such as vertical farming, hydroponics and aquaponics. These systems are particularly relevant in land-scarce regions and are increasingly viewed as part of the future of food.

Equally important is biodiversity protection and ecosystem restoration, including reforestation, peatland conservation and land rehabilitation—efforts that help preserve natural habitats while supporting agricultural sustainability.

The framework also targets water and chemical management, energy efficiency in food production, and food waste reduction, recognising that sustainability improvements must occur throughout the food supply chain rather than only at the farm level.

Tackling Food Waste and Resource Efficiency

Food loss remains a major global challenge. The framework therefore supports investments in technologies and systems that improve food waste tracking, redistribution, and recycling.

These initiatives range from waste-to-bioenergy solutions to improved logistics systems that reduce post-harvest losses. Sustainable packaging and circular material use are also emphasised, reflecting growing awareness that packaging waste is a major environmental issue linked to the food industry.

Supporting SMEs on the Sustainability Journey

A significant focus of the initiative is helping small and medium-sized enterprises (SMEs) transition toward sustainable practices.

Through advisory tools and partnerships with sustainability service providers, businesses can assess their ESG maturity and identify practical steps to improve environmental performance. Financial incentives such as sustainability-linked loans can then support companies that achieve measurable sustainability targets.

Strengthening Sustainable Supply Chains

Another important element of the framework is the promotion of verified sustainable sourcing through recognised certification standards. These include internationally recognised sustainability certifications covering commodities such as palm oil, coffee, cocoa, aquaculture products and forestry materials.

By aligning trade financing with certified sustainable goods, the framework helps strengthen responsible supply chains across Asia. Collaboration with large regional retailers and food companies further expands the impact by accelerating sustainability adoption across entire industry ecosystems.

A Financial Catalyst for Food System Transformation

The agriculture and food sector faces a profound transformation as climate change, resource constraints and shifting consumer expectations reshape global markets.

Financial institutions have an increasingly important role in enabling this transition—providing not only capital but also strategic guidance and partnerships that support sustainable innovation.

Initiatives such as the sustainable food and agribusiness framework developed by UOB highlight how finance can act as a catalyst for greener food systems. By aligning capital flows with climate-smart agriculture, biodiversity protection and circular resource management, such frameworks help move the region closer to a more resilient and sustainable food future.

Alabama Department of Transportation Enhances Performance-Based Budgeting with Bentley Systems' AI-Powered Blyncsy Solution

ALDOT leverages Blyncsy to improve statewide asset surveys and strengthen data-driven maintenance planning

Bentley Systems, Incorporated (Nasdaq: BSY), the infrastructure engineering software company, announced on February 5th, 2026 the Alabama Department of Transportation (ALDOT) is using Bentley's Blyncsy solution to enhance its existing performance -based budgeting process for highway maintenance. ALDOT adopted a performance-based budgeting model more than 15 years ago and continues to refine its implementation to ensure maintenance funds are allocated based on objective, date-driven insights.

Historically, collecting asset condition data across Alabama's 11,000 miles of roadway network has required significant manual effort and resources. While ALDOT has long employed a data-driven statewide survey, traditional methods, such as manual inspections, are labor-intensive and can introduce inconsistencies. To improve efficiency and accuracy, ALDOT is incorporating Blyncsy's automated AI analytics into its established process, providing a faster and more consistent assessment of specific designated roadway assets.

Blyncsy, part of Bentley's Asset Analytics portfolio, uses crowdsourced high-resolution dash camera imagery from vehicles and applies AI to automatically analyze roadway conditions. This provides a consistent, empirical assessment of critical assets, such as guardrails and signage to name a few, across the entire roadway network. A previous pilot project demonstrated that Blyncsy's AI models achieved 97% accuracy, providing the reliable data foundation required for precise financial planning.

"To strengthen our performance-based budgeting, we need consistent, quantified data to produce condition assessments across all districts," said Morgan Musick, Assistant Maintenance Management Engineer at ALDOT. "Bentley's Blyncsy solution helps us enhance our existing statewide survey by automating certain asset inspections. This technology helps to give us an objective snapshot of our roadway network, enabling us to adjust budgets based on actual asset conditions and ensure funding goes to appropriate maintenance activities in order to better reach a target Level of Service for each asset."

Mark Pittman, senior director of Transportation AI at Bentley Systems, added, "The future of infrastructure asset management depends on making financial decisions based on empirical evidence rather than historical precedent. By integrating AI-powered asset inspection into its performance-based budgeting process, ALDOT is setting a new standard for data-driven infrastructure planning."

Sustainable Fashion in Southeast Asia: Batik Valiri and the Heritage of Sigi's Ranjuri Forest

Across Southeast Asia, fashion has long been shaped by deep cultural heritage and community identity. From handwoven textiles to intricate batik patterns, traditional fabrics are not merely garments but living expressions of history, nature, and cultural values. Today, these traditions are finding renewed relevance as the global fashion industry undergoes a transformation, with consumers increasingly seeking clothing that reflects not only personal style but also environmental and social responsibility. According to a global study 70% of the consumers wish to adopt more sustainable habits.

The trend of eco-friendly fashion is especially significant in Southeast Asia, where many traditional textiles embody principles of manual production processes and natural materials with strong connections to local ecosystems. Singapore is also experiencing a broader shift towards sustainable fashion choices as per a survey with 34% of consumers likely to purchase a fashion item marked as "sustainably made". This statistic shows awareness of fashion's environmental footprint and a demand for transparency in production. The rise of thrift platforms, preloved fashion exchanges, and eco-conscious brands further illustrates how sustainability has become both a lifestyle choice and a statement of values.

In Indonesia, this shift opens new spaces for batik to transcend its symbolic function and enter the trending global arena of sustainable fashion. However, beyond the major production centers, there are smaller, rarely heard stories of how nature, tradition, and creativity meet in a single piece of cloth. One such story grows from an ancient forest and residential area protected by customary law in Sigi Regency, Central Sulawesi. Sigi preserves its cultural heritage through textile craft "Batik Sigi" which depicts the harmonious relationship between the community and its natural environment. Through

motifs inspired by flora, fauna, cultural values, and local history, this batik serves as an identity connecting a grand past with the contemporary spirit of sustainability.

In a global fashion industry increasingly saturated with mass production, traditional fabrics like Batik Valiri from Sigi are finding their place as symbols of style, identity, and eco-consciousness. From runways to the wardrobes of urban consumers, tradition-based textiles are no longer viewed solely as ceremonial attire but a statement of values and human connection to nature.

Nurturing Sigi's Tradition and the Ranjuri Customary Forest Through Batik Valiri

The Ranjuri forest with the Rau tree and natural materials for the dye

In Beka Village, Marawola District, a small forest of approximately 9 hectares serves as a lifeline for the local community. The Ranjuri Forest, guarded by indigenous people for generations, is not only an ecological fortress protecting the village from flash floods and droughts but also the source of inspiration for Batik Valiri, the only distinctive Sigi batik artisan currently in operation.

Valiri is derived from the Kaili language, meaning "it happens here." The name refers to the area surrounding the Ranjuri forest where people have long depended on the land, bringing cultural values and local knowledge systems to life. Afrianto, the founder of Batik Valiri, established his business in 2019 after years of working in the batik industry in Palu City. This experience was further enriched by batik training organized by the Sigi Regency Government. From his journey, he realized that Sigi's wealth had almost never been highlighted through batik.

"For a long time, batik has been synonymous with Javanese motifs. Yet in Sigi, we have a very strong wealth of nature, culture, and history. From the Ranjuri forest alone, which is only about 50 meters from our production site, I saw so many things that could be showcased, including natural dyes that can be developed from plants within that ancient forest," said Anto.

The uniqueness of Batik Valiri lies in its motifs. Every pattern is more than a visual ornament; it holds the philosophy and identity of the region. The taiganja motif, for example, symbolizes fertility and depicts feelings of love and sincerity. It also represents a woman's womb, which the Kaili people believe to be the beginning of human life. In Kaili tradition, the taiganja is a sacred object shaped like a pendant that plays a vital role in traditional ceremonies. It is often used as a marriage dowry and is part of symbolic traditional rituals. Through Batik Valiri, the meaning of taiganja, which was becoming less known, is revitalized so it can be understood and valued within a modern cultural context.

Beyond the taiganja motifs, Batik Valiri also features the Rau Tree (Dracontomelon dao) from the Ranjuri Forest, moringa leaves, the traditional guma weapon, and the megalithic traces scattered throughout Sigi. All these motifs serve as a medium to introduce Sigi's natural, social, and historical wealth to a broader public.

From a production standpoint, Batik Valiri combines stamp and hand drawn techniques with contemporary approaches such as abstract brushstrokes and the "ciprat" or splatter technique. The natural dyes used are harvested from the biodiversity of the Ranjuri forest, an ecosystem that, while small in size, provides a massive impact on the lives of residents.

The signature colors of Batik Valiri are born from natural materials found nearby. Rau leaves produce a soft cream hue, mango leaves provide a fresh yellowish green touch, while teak and ketapang leaves create elegant reddish brown and black nuances. Through this palette, Batik Valiri tells a story of cooperation, respect for tradition, and an economic future firmly rooted in forest conservation.

The natural dyeing process is time consuming. Ten kilograms of dried leaves are only enough to dye about five pieces of cloth, involving a four-hour boiling process and repeated dipping up to twenty times to ensure the color penetrates perfectly.

"Synthetic dyes only need one dip for the color to appear. But natural dyes require patience. That is what makes the value different," Anto explained.

Interestingly, the indigenous community of Beka Village only collects fallen leaves without cutting down trees. Forest management is conducted through consultations with traditional leaders, and every activity within the Ranjuri area requires customary permission. Although administratively categorized as production forest, socially it is guarded as a sacred space and a source of life. When flash floods hit Sigi, this forest acted as a natural buffer. During droughts, the residents' clean water source comes from the same area.

Gampiri Interaksi Incubation and Transition to Natural Dyes

The process of Batik stamping

Despite its strong cultural values, Batik Valiri's journey has not always been easy. In its early days, Anto still used synthetic dyes due to limited knowledge, market access, and technical support. A significant change occurred when Batik Valiri joined the Gampiri Interaksi incubation program.

Through eight months of intensive mentoring, Gampiri Interaksi helped Batik Valiri strengthen institutional governance, establish production operational standards, increase human resource capacity, and open access to markets and capital. This assistance also aligned with the efforts of the Environmental Agency which, in 2024, encouraged the use of natural dyes from the Ranjuri Forest. "Batik Valiri was already strong socially and culturally, but its environmental aspect needed strengthening. Through workshops and collaboration, we encouraged the transition to natural dyes without damaging the ecosystem," said Nedya Sinintha Maulaning, a representative of Gampiri Interaksi.

The natural dye workshops involved Batik Valiri employees and villagers, introducing color extraction techniques, color locking using natural materials like betel lime and iron based tunjung, and the

importance of regenerating dye plants. As part of a sustainability commitment, mango, ketapang, and teak trees were replanted in the Ranjuri area, alongside a tree adoption program that covered approximately 50 trees in 2023.

Anto believes this mentoring opened a new perspective. "I now understand business processes, SOPs, public speaking, and gallery arrangement. Previously, production and sales were handled haphazardly, but now everything is more organized and sustainable," he said.

Currently, a portion of Batik Valiri's production utilizes natural dyes, though synthetic dyes are still maintained for certain market segments. However, the direction of the transition is clear as market interest in eco-friendly products with local stories continues to rise. Moving forward, Batik Valiri will process fabric into derivative products to be showcased at various local and national events.

Community Income Value of Batik Valiri

Batik Valiri is now a source of livelihood for about ten people, mostly village youth and housewives. Before joining Gampiri Interaksi, the business turnover was around 10 million IDR per month. Following the mentoring and capacity building, income increased to approximately 25 million IDR per month, with product prices ranging from 500,000 IDR to 1 million IDR depending on the motif and dyeing technique.

The market is not limited to local buyers. In addition to serving the needs of the local community and regional government offices, Batik Valiri has gained national recognition. This growth is supported by local government policies that encourage the use of regional batik through the Valiri Batik Workshop, as well as their strategic use of Instagram to reach customers outside the Sigi region.

Through the Gampiri Interaksi and Kabupaten Lestari networks, Batik Valiri is now frequently chosen as the official souvenir for various cross-provincial visits and international partners. To date, there have been recorded visits from representatives of various countries, including Brazil, the United States, and Japan. These international guests visit with the intent to learn about the production process firsthand while also shopping for authentic pieces.

Batik Valiri is also being developed as part of an experience-based ecotourism package. Tourists are invited to explore the Ranjuri Forest, learn the philosophy behind the motifs, and try their hand at the batik process. This concept has been piloted in several local, national, and international activities as an effort to unite natural, cultural, and economic potential into one ecosystem.

"My hope is that Batik Valiri becomes better known, and that the youth of Sigi believe they can create and live decently from their own culture," Anto said. He also hopes the workforce can expand so that training and workshop participants do not just learn but are truly absorbed into the business.

Batik Valiri is part of Sigi Regency's transformation toward becoming a sustainable district by presenting economic practices rooted in local values and sustainability. Through community based business strengthening, wise resource utilization, and local value creation, Batik Valiri helps drive a restorative economy that boosts community income while strengthening regional social and economic resilience. In line with the vision of the Sustainable District Association (LTKL), this initiative demonstrates that development can rely on local strengths, protect nature, and foster sustainable prosperity. This reaffirms Sigi's role in the collective movement of sustainable districts in Indonesia.

For Gampiri Interaksi and LTKL, Batik Valiri is a concrete example of a restorative economy in action. When forests are protected, culture is revitalized, and the community is involved, prosperity can grow without having to choose between the economy or the environment. In Sigi Regency, where about 70 percent of the area is forest, such practices show that natural restoration can indeed be the foundation for economic recovery.

Exclusive Clifftop All-Villa Sanctuary Umana Bali Unveils “Bali Getaway” Experience

Dramatically perched above the Indian Ocean on the southernmost cliffs of Bali’s coveted Ungasan peninsula, above pristine white sands, Umana Bali, LXR Hotels & Resorts is inviting travellers to experience a more meaningful side of the Island of the Gods with the launch of its new Bali Getaway offer.

Available for stays throughout the remainder of 2026, the Bali Getaway experience includes up to 10% off best available rates, daily breakfast, sunset sundowners and a signature dinner for two at the resort’s Mediterranean clifftop restaurant Oliverra, alongside a curated selection of Umana Bali’s cultural experiences and a rejuvenating couples’ spa ritual featuring hot and cold-water immersion.

The new tropical escape hidden away at the southernmost tip of the island invites travellers to discover culture, spirituality and wellness at Southeast Asia’s first LXR Hotels & Resorts retreat

Umana Bali, which opened just over a year ago, is an all-villa clifftop sanctuary in Ungasan comprising 72 expansive one, two and three-bedroom villas, each offering complete privacy with their own infinity-edge pools, outdoor hot tubs and sweeping Indian Ocean views. Set high above the coastline, the resort also offers direct access to its own beach club on fashionable Melasti Beach, one of Bali’s most pristine and desirable stretches of white sand – located well away from the crowds.

Inspired by cascading villa terraces reminiscent of Bali’s ancient uma rice paddies, from which the resort takes its name, Umana Bali is the first LXR Hotels & Resorts retreat in Southeast Asia, marking a significant milestone for this new luxury brand portfolio by Hilton.

A deeper way to experience Bali

At the heart of Umana Bali lies LXR’s ‘Pursuit of Adventure’ philosophy, a celebration of experiential travel that invites guests to connect with a destination through authentic, curated encounters. Here, that promise is realised through an embrace of the “Bali Way of Life,” revealing what the resort describes as the island’s enduring secret to happiness.

Guided by the Balinese philosophy of Tri Hita Karana, which emphasises harmony between humans, nature and the divine, guests are immersed in experiences that go far beyond traditional tropical holidays, offering insight into Bali's living culture, spirituality and human connection.

Umana Bali's cultural programmes open doors to both the artistic and ancestral traditions of the island. For instance, guests can gain insight into the philosophy of Balinese dance by stepping into the dancers' world, interacting with rituals and understanding their deeper meaning. The island's mesmerising Kecak Dance is experienced during a private sunset performance on the beach, far removed from crowds, while guests can also take part in activities such as hands-on rice paddy planting, revealing ancient agricultural techniques passed down through generations, or stargazing with a resident astronomer.

Elevated wellness and holistic wellbeing

Wellness and spirituality converge at Lohma Spa, a serene sanctuary dedicated to restorative wellbeing. Drawing on ancient healing traditions, the spa's signature Tri Hita Karana Journey releases stress through a welcoming foot ritual, followed by a scrub and wrap, bathing ritual, extended massage and a facial using a jade roller.

Contemporary therapies complement these traditions, while cold-water immersion enhances cardiovascular circulation and holotropic breathing sessions harness inner strength for personal growth. Guests also have access to a sauna, steam room and revitalising hot and cold plunge pools, with wellness extending to an open-air yoga pavilion offering complimentary group sessions for all skill levels. A 24-hour fitness centre duplex, equipped with state-of-the-art technology, supports training at any time of day or night.

Dining rooted in place

Dining at Umana Bali reflects a strong commitment to locality and sustainability, with more than 80% of fresh produce sourced from local growers and the resort's own hydroponic garden. The clifftop Oliverra showcases Mediterranean flavours against a dramatic ocean backdrop, while Uma Beach House on Melasti Beach delivers a modern, high-energy beach-club vibe, offering vibrant Peruvian and Mexican cuisine on one of Bali's most pristine stretches of sand.

The all-day Commune restaurant serves Southeast Asian and international dishes from breakfast through dinner, while MER Lounge offers craft coffee, beer and a wine cellar boasting more than 200 labels. Pad Pool Bar provides light bites and sunset cocktails overlooking the ocean.

A setting for celebration and connection

Umana Bali also caters to weddings, celebrations and corporate retreats, with facilities including a private chapel framed by panoramic ocean views, a glamorous ballroom for receptions and galas, and flexible event spaces designed for both productivity and social gatherings. Families are welcomed with a dedicated Kids Club, offering a safe and fun environment where children under 12 can explore, learn and create.

As the first LXR Hotels & Resorts property in Southeast Asia, Umana Bali continues to play a key role in the global growth of the brand, as the collection approaches 40 properties operating or under development worldwide.

Resilience on the Ground: Advancing Climate-Ready Farming in India

In the face of intensifying climate volatility, meaningful agricultural transformation is no longer measured in pilot projects, but in livelihoods strengthened and ecosystems restored. A recent recognition highlights how structured corporate engagement can move the needle for thousands of smallholder farmers.

Recognition with Purpose

At the FICCI Awards in India, Team LDC was recognized for advancing resilient farming systems and strengthening climate readiness in rural communities. The recognition underscores a growing shift in how agribusinesses engage with sustainability — not merely through commitments, but through measurable impact on the ground.

Such acknowledgments signal that resilience-building is moving from corporate social responsibility to core strategy.

Water Security as a Foundation

Water stress remains one of the most critical constraints facing Indian agriculture. Through targeted interventions, improved water security has been achieved across 10 villages, positively impacting approximately 3,400 farmers.

Access to reliable water resources directly influences crop productivity, income stability and long-term community resilience.

Strengthening Climate Readiness

Beyond water interventions, more than 6,000 farmers across 38 villages have strengthened their climate preparedness. This includes adaptive agricultural practices, risk mitigation strategies and improved resource management.

Climate readiness is no longer theoretical; it is operational — embedded into farming decisions, crop planning and community-level collaboration.

From Impact Metrics to Human Outcomes

While numbers provide scale, the true measure of impact lies in farmer confidence and income security. Resilient farming systems reduce vulnerability to erratic rainfall, input price volatility and market shocks.

By integrating sustainability into value chains, agribusinesses demonstrate that commercial viability and community development can reinforce each other rather than compete.

A Model for Future Engagement

As global food systems confront climate uncertainty, scalable models that combine corporate investment, local participation and measurable outcomes will define the next chapter of agricultural sustainability.

Recognition at national platforms such as FICCI highlights that resilient farming is not peripheral to business — it is central to long-term supply chain stability and shared prosperity.

Source: Adapted from 'Making a Meaningful Difference in Farming Communities' and FICCI Award India recognition materials (2025).

IES Prepares Engineers for Opportunities in Emerging Technologies at World Engineering Day 2026

- *Ngee Ann Polytechnic partners SkillsFuture Queen Bee Siemens to launch smart manufacturing platform, and the Agency for Science, Technology and Research (A*STAR) to introduce the first stackable Specialist Diploma inSmart Manufacturing for the acceleration of Industry 4.0 adoption and upskilling.*
- *New national standards supported by the IES-Standards Development Organisation (IES-SDO) launched to support healthier indoor environments and sustainable cooling.*

The Institution of Engineers, Singapore (IES) brought together leaders from industry, academia and public agencies at the **World Engineering Day 2026: Charles Rudd Distinguished Global Lectures (WED 2026: CRDGL)** to examine how emerging technologies are reshaping the future of engineering. The event carried the theme "**Engineers and the Future of Engineering: Opportunities of Emerging Technologies**". **Ms Indranee Rajah, Minister, Prime Minister's Office, Second Minister for Finance and Second Minister for National Development**, graced the event as the guest-of-honour.

At the event, NP announced two major initiatives to strengthen Singapore's advanced manufacturing ecosystem. Firstly, in partnership with **Siemens** – **the only SkillsFuture Queen Bee in advanced manufacturing** – NP will launch a **leading-edge smart manufacturing platform** aimed at helping SMEs kickstart their transformation journey. Secondly, NP and the Agency for Science, Technology and Research (A*STAR) will introduce **Singapore's first stackable Specialist Diploma in Smart Manufacturing (SDSM)** with a strong focus on the use of Artificial Intelligence for industrial innovation.

Accelerating Industry 4.0 Adoption through Applied Innovation

Developed through NP's strategic partnership with Siemens, the smart manufacturing platform integrates digital technologies, automation and data analytics within a reconfigurable, industry-ready set-up. The platform enables companies, particularly SMEs, to pilot automation and robotics solutions for specific manufacturing processes before deploying them at scale in their own facilities. By lowering adoption risks and shortening experimentation cycles, the platform supports faster and more confident Industry 4.0 transformation. Through Siemens 'industry expertise and NP's strengths in applied engineering education, companies gain both technology solutions and the capabilities to support their implementation.

Future-Proofing the Workforce with AI-Focused Skills for Smart Manufacturing

Complementing the platform, NP, in partnership with A*STAR, will introduce Singapore's **first stackable Specialist Diploma in Smart Manufacturing (SDSM)**. Designed for industry practitioners like engineers, manufacturing professionals and also fresh graduates, the SDSM equips learners with applied capabilities in next generation manufacturing such as AI, automation and more.

The programme adopts a module stackable structure, where learners accumulate Post-Diploma Certificates (PDCs) towards a full Specialist Diploma. PDCs and selected short courses are cross-recognised between NP and A*STAR, allowing learners to progressively build their qualification through modules offered by both training providers. For a start, under this model, NP will offer two PDCs in Smart Manufacturing Automation & Analytics and Industrial Cybersecurity & Resilience, while A*STAR will offer another in AI for Manufacturing.

As the first polytechnic-led programme to offer a stackable and scalable pathway towards a full qualification in smart manufacturing, the SDSM provides learners with greater flexibility while deepening their expertise in smart manufacturing. “As AI and the rapid pace of technological change reshape the engineering landscape, education and industry must work closely to translate innovation into real-world impact. By partnering Siemens and A*STAR, NP will enable companies to pilot smart manufacturing solutions and equip engineers with the skills to optimise them. Through this integrated approach, we will collectively strengthen Singapore’s advanced manufacturing ecosystem,” said Mr Lim Kok Kiang, Principal & CEO, Ngee Ann Polytechnic.

Healthier and Sustainable Building Practices

During the event, three key standards for the built environment, TR 141:2025 for hybrid cooling systems, SS 553:2026 for air-conditioning and mechanical ventilation, and SS 554:2026 for indoor air quality in air-conditioned buildings, were also launched. These national standards were developed by expert work groups under the Singapore Standards Council, which is overseen by Enterprise Singapore. The updated standards provide updated guidance on hybrid cooling while maintaining thermal comfort and indoor air quality, as well as on energy-efficient measures to reduce airborne disease transmission during an outbreak. The guidance on hybrid cooling is aligned with the Go 25 movement, which aims to sustain indoor ambient temperatures at around 25°C to reduce energy consumption, prevent overcooling and strengthen long-term climate resilience. The Go 25 initiative is led by the Ministry of Sustainability and the Environment and the Singapore Green Building Council, with support from the Building and Construction Authority and the National Environment Agency.

IES60: Looking Ahead

As part of its 60th anniversary (IES60) celebrations, IES unveiled the IES60 logo at WED 2026: CRDGL. The commemorative logo marks six decades of IES’ contributions to the engineering fraternity while underscoring the institution’s continued commitment to advancing engineering excellence and innovation. The IES60 milestone will feature a year-long series of commemorative programmes and industry engagements celebrating six decades of nation-building and the evolving role of engineers in shaping Singapore’s future. “As IES marks 60 years, we are focused not only on celebrating our heritage, but on strengthening the profession for the future. Through collaboration with institutions, industry and regulators, we will continue to equip engineers with the capabilities needed for emerging technologies,” said Er. Chan Ewe Jin, President, IES.

World Engineering Day 2026: Charles Rudd Distinguished Global Lectures

WED 2026: CRDGL is a key highlight of IES60. Distinguished speakers **Dr Bicky Bhangu,** Operating Partner, Emerging Technologies, Temasek Holdings, and **Dr Hanbin Zheng**, Head of Science and Technology Network, British High Commission, shared insights on technological transformation and

the future skills required of engineers. WED for Sustainable Development is observed annually on 4 March to highlight engineering's role in modern life and sustainable development. Proclaimed by UNESCO in 2019 and organised by the World Federation of Engineering Organizations (WFEO), it features global activities that showcase innovative solutions supporting the United Nations Sustainable Development Goals.

About The Institution of Engineers, Singapore

The Institution of Engineers, Singapore (IES) was formally established in July 1966 as the national society of engineers in Singapore. IES is the premier engineering institution in Singapore and is called upon by the Government to provide feedback on professional engineering matters.

IES is well represented among the faculty members of the major engineering institutions of higher learning in Singapore. Through close collaboration with the local universities and polytechnics, IES organises courses, seminars and talks for engineers and IES members to advance the continuous development of engineers.

The Institution maintains close links with professional organisations of engineers regionally and throughout the world. These include organisations in Australia, China, Japan, United Kingdom and the United States. The Institution also represents Singapore in the ASEAN Federation of Engineering Organisations (AFEO) and the Federation of Engineering Institutions of Asia and the Pacific (FEIAP) in promoting goodwill and fellowship among all engineers in ASEAN and the Asia-Pacific region.

Through its Engineering Accreditation Board (EAB), IES obtained full signatory status in the Washington Accord (WA) in June 2006. The entry grants IES the authority to represent Singapore, the first country within the ASEAN region which has obtained full signatory status in the WA, to vet education systems under the WA mutual recognition framework. For more info, visit www.ies.org.sg.

About Ngee Ann Polytechnic

Ngee Ann Polytechnic started in 1963 and is today one of Singapore's leading institutions of higher learning with over 13,000 enrolled students in about 40 courses across diverse disciplines. It seeks to develop students with a passion for learning, values for life, and competencies to thrive in a global workplace. The polytechnic also supports Continuing Education and Training (CET) through its CET Academy, which offers a wide range of part-time programmes and short courses. It works closely with industry partners to curate

Stronger support and partnerships to bring urban innovations to the market

The theme for this year's Urban Solutions and Sustainability (USS) Research & Innovation Congress was "Re-inventing Cities of Tomorrow", which reflected the importance of harnessing technology and innovation to reimagine and reshape the future of Singapore's urban environment. The Congress brought together participants across government agencies, academia and industry to exchange ideas and explore innovative solutions on urban sustainability.

Miniter's Tour of the Exhibition at the Urban Solutions and Sustainability R&I Congress 2026

In his opening speech, Minister for National Development Mr Chee Hong Tat highlighted the importance of research and innovation to maintain Singapore's competitive edge and ensure a high-quality living environment for Singaporeans. He announced the following key initiatives to accelerate the translation of research and innovation into meaningful, real-world outcomes:

1. USS Translation Fund – The USS Translation Fund is a new $40 million funding programme by the Ministry of National Development (MND) and Ministry of Sustainability and the Environment (MSE) to support local companies develop, pilot and commercialise promising urban and sustainability solutions. Administered by the USS Innovation & Enterprise Office (USS IEO), a national platform hosted by A*STAR, the fund helps companies translate high-potential USS research into cost-effective market-ready products. By supporting the commercialisation of innovative solutions, the Fund creates potential business opportunities across key USS sectors including the built environment, water, environmental services, and agri-food industries.

2. Streamlined Procurement of Research Innovations & Technology (SPRINT) – MND launched a new green lane procurement programme, SPRINT, to streamline procurement and expedite government adoption of innovative research products. SPRINT will be administered by HDB and BCA, and piloted by MND Family agencies. During the pilot phase, companies that meet SPRINT's requirements become qualified vendors, enabling direct procurement by MND Family agencies. This streamlined process is expected to halve procurement timelines. SPRINT will also help companies strengthen their credentials as part of the panel of qualified government suppliers, widen their market access, and build their industry track records.

3. Built Environment AI Centre of Excellence – MND, in partnership with the Singapore University of Technology and Design (SUTD), launched a new $30 million Built Environment AI Centre of Excellence (BE AI CoE). This centre will foster collaboration between Government agencies, academia and industry to develop AI-driven solutions that address key challenges in the BE sector, such as manpower shortages in the labour-intensive construction and facilities management sectors, and climate change impacts. The CoE aims to transform work processes to enhance productivity, sustainability, and liveability whilst nurturing 'AI bilinguals' – professionals with both technical AI expertise and practical understanding of BE sector challenges.

Additionally, the Building and Construction Authority (BCA) launched a decarbonisation technology roadmap at the Heat Resilience Breakout session on 6 February 2026:

Built Environment Decarbonisation Technology Roadmap – BCA and Singapore Green Building Council (SGBC), with support from A*STAR, have jointly developed a roadmap which identifies close to 70 key technologies and strategies. This roadmap will guide research and innovation efforts towards achieving the Singapore Green Building Masterplan's (SGBMP)'s "80-80-80" targets by 2030 and work towards our longer-term target for net-zero emissions by 2050. Market-ready strategies and solutions such as alternative cooling and ventilation technologies, AI-controlled energy optimisation systems and low carbon construction practices will help developers and building owners decarbonise their building portfolios, while identified emerging technology priorities will support Singapore's Research, Innovation, and Enterprise (RIE) 2030 plan.

New Energy Efficiency Training Facility to Boost Singapore's Energy Efficiency and Decarbonisation Capabilities

The Energy Efficiency Technology Centre (EETC), a collaboration between the National Environment Agency (NEA) and Singapore Institute of Technology (SIT), opened its new Energy Efficiency Training Facility (EETF) at SIT Punggol Campus on 9th February 2026. It was launched by Senior Minister of State, Ministry of Sustainability and the Environment and Ministry of Education, Dr Janil Puthucheary. The new 430 square-metre facility features Singapore's first integrated suite of industrial systems that provides practical training simulating real-world manufacturing conditions in Small and Medium-sized Enterprises.

SIT and EETF Opening Ceremony. Credit - SIT & Keng Photography

New Energy Efficiency Training Facility is Singapore's first to provide training within a real-world setting

The facility, the first of its kind in Singapore, houses comprehensive industrial systems including pump, compressed air, lighting, fan, electric motor, air-conditioning and mechanical ventilation, heat pump, boiler and steam trap. It also features an Energy Management System with simulation capabilities and real-time data collection, analysis, and monitoring. With the facility, participants can carry out energy efficiency assessments in a safe and controlled environment, without disrupting actual operations or incurring costly downtime. SIT students undergoing their Integrated Work Study Programme (IWSP) will also be able to work alongside EETC professionals at the facility to acquire practical energy audit skills.

The EETF also serves as a platform for applied research and digital innovation. SIT has entered into a Research Collaboration Agreement with Willowglen Services Pte Ltd to develop a Sustainability Reporting System for the new training facility. Leveraging operational data from industrial systems, the project enables real-time monitoring and analytics of energy consumption, carbon emissions and system performance, enhancing training and research outcomes. SIT students may also be involved as part of their coursework, reinforcing the integration of education, research and industry collaboration.

SIT President Professor Chua Kee Chaing said, “This training facility underscores SIT’s commitment to applied learning and industry-relevant education. As the first of its kind facility in Singapore’s tertiary landscape, it enables engineers, managers, technologists and engineering students involved in energy efficiency, decarbonisation and sustainability domains to gain authentic, hands-on experience using industrial systems typically found in the manufacturing sector. By bringing industry-grade systems in-house, learners will be able to benefit from more structured, scalable and immersive training, strengthening workforce readiness and supporting Singapore’s energy efficiency and decarbonisation efforts.”

Energy Efficiency Technology Centre steadily increasing support to build local industrial energy efficiency capabilities

With the new Energy Efficiency Training Facility, the EETC is expected to deliver an estimated 1,500 hours of practical and hands-on training annually, benefiting around 400 participants each year across its various programmes and outreach activities, including the Energy Efficiency Upskilling Programme (EEUP) and the Singapore Certified Energy Manager (SCEM) programme. Since the EETC's inception in 2020, it has supported more than 50 companies with over 250 industrial systems assessed and has trained 100 students whilst upskilling more than 500 professionals through the EEUP.

About the National Environment Agency

The National Environment Agency (NEA) is the leading public organisation responsible for ensuring a clean and sustainable environment for Singapore. Its key roles are to improve and sustain a clean environment, promote sustainability and resource efficiency, maintain high public health standards, provide timely and reliable meteorological information, and encourage a vibrant hawker culture. NEA works closely with its partners and the community to develop and spearhead environmental and public health initiatives and programmes. It is committed to motivating every individual to care for the environment as a way of life, in order to build a liveable and sustainable Singapore for present and future generations.

About the Singapore Institute of Technology

As the university for industry and Singapore's first university of applied learning, the Singapore Institute of Technology (SIT) offers industry-relevant degree programmes that prepare its graduates to be work- and future ready professionals. Its mission is to maximise the potential of its learners and to innovate with industry, through an integrated applied learning and research approach, so as to contribute to the economy and society. The University’s unique pedagogy integrates work and study, embracing authentic learning in a real-world environment through collaborations with key strategic partners. Its focus on applied research with business impact is aimed at helping industry innovate and grow. SIT’s new centralised campus within the larger Punggol Digital District features a vibrant learning environment where academia and industry are tightly integrated with the community.

For more information, visit www.SingaporeTech.edu.sg

Reimagining Food Security Through Sustainability Led Innovation

By Gareth Lloyd, CEO and Co-Founder of TRULY NUTS! and Co-Founder of White Lion Foods, a Singapore-based agri-tech group focused on sustainable food supply chains.

Singapore's ambition to produce 30 percent of its nutritional needs locally by 2030 represents one of the most forward-thinking food security strategies in the world. For a nation that imports the majority of what it consumes, this goal is not simply ambitious. It reflects a clear recognition that the future of food cannot rely on global supply chains alone. Climate uncertainty, geopolitical tensions, and resource pressures are reshaping how nations must think about food resilience.

According to the Singapore Food Agency, Singapore imports more than 90 percent of its food, and local production currently meets only about one tenth of national nutritional needs. This underscores both the scale of the challenge and the urgency behind the 2030 target. Land and water limitations cannot be changed, but the way we approach food systems can.

Innovation Beyond Production

When people think about food security, they often focus on agriculture alone. Yet the future of food resilience lies across the entire value chain, from ingredient innovation and alternative proteins to advanced processing, supply chain optimisation, and circular resource use. Sustainability led food innovation is not a single breakthrough. It is an ecosystem of continuous improvements that collectively transform how food reaches consumers.

As someone working closely with food innovation ecosystems, I see firsthand how rapidly expectations are changing. Businesses are no longer asking whether sustainability matters, but how quickly they can integrate it. Investors, regulators, and consumers are aligning around the same principle that growth must be responsible as well as profitable. This convergence creates a powerful environment for progress.

Singapore is uniquely positioned to lead in this space. Its strong research infrastructure, supportive policy frameworks, and openness to collaboration allow ideas to move from concept to commercialisation with remarkable speed. Equally important is the country's ability to attract global partnerships, bringing together expertise from multiple markets to accelerate development.

The Role of Industry Leadership

Private sector leadership plays a crucial role in translating national ambition into tangible outcomes. Companies across the food sector are investing in new ingredients, sustainable sourcing models, and technologies that reduce waste and energy consumption. These efforts are not only environmentally responsible but commercially strategic. Efficiency gains, resource resilience, and consumer trust are increasingly interconnected drivers of long-term competitiveness.

Leadership also requires a mindset shift. Sustainability should not be viewed as a compliance requirement or a marketing narrative. It must be embedded into core decision making, from procurement strategies to product design. When sustainability becomes integral to innovation, it unlocks opportunities that extend beyond risk mitigation toward genuine value creation.

Collaboration remains essential. Governments can provide direction and infrastructure. Research institutions can generate breakthroughs. Businesses can scale solutions and bring them to market. Consumers can reinforce progress through informed choices. Food security is ultimately a shared responsibility, and success depends on alignment across these stakeholders.

Building Consumer Confidence

Consumer acceptance is often the deciding factor in whether food innovation succeeds. New products and technologies must deliver on taste, nutrition, affordability, and trust. Transparency around sourcing, production methods, and environmental impact helps build confidence, particularly as consumers become more conscious of how their choices affect both personal health and planetary wellbeing.

Education also plays an important role. When people understand the benefits of sustainable food innovation, whether through improved nutrition, reduced environmental impact, or enhanced resilience, they are more willing to embrace change. Over time, these shifts in perception can reshape demand patterns and support the growth of new industries.

A Vision Beyond Borders

Singapore's journey toward stronger food resilience has implications far beyond its borders. Many countries face similar pressures, including climate volatility, supply chain disruption, and population growth. Solutions developed in Singapore can serve as models for other urbanised and resource constrained nations seeking sustainable pathways forward.

The opportunity extends beyond national food security. The nations that succeed in the future will not be those with the most land, but those with the most imagination. Singapore has the opportunity to prove that innovation can overcome scarcity. Sustainability led food innovation is not just a pathway to resilience, it is a blueprint for the future of food.

About Gareth Lloyd:

As a leading entrepreneur, Gareth Lloyd co-founded White Lion Foods, a global Agri-tech group headquartered in Singapore. Under his leadership, White Lion Foods swiftly became the world's leading processor of Brazil nuts, exporting to over 50 countries while supporting sustainable harvesting in the Amazon rainforest. From White Lion Foods, the healthy snack brand TRULY NUTS! was born. The company offers the world's first savoury flavoured Brazil nut snacks as well as allocating 25% of its profits to environmental initiatives focused on rainforest protection and long-term ecosystem resilience, marking a significant step toward creating positive impact in the world.

Decoding Building Energy Consumption: The Path to Low-Carbon Transformation

As cities accelerate towards climate targets, the built environment has emerged as a critical frontier in the transition to a low-carbon future. Buildings today are not just physical structures—they are major consumers of energy and significant contributors to carbon emissions. Understanding and optimising building energy consumption is therefore central to achieving sustainable urban development.

Building energy consumption refers to the total energy used during a building's operational phase, including heating, cooling, ventilation, lighting, and water systems. This consumption directly influences both environmental impact and operational costs. Inefficient energy use in buildings contributes to rising emissions, intensifying climate risks such as global warming and extreme weather events.

A key distinction in the green building landscape lies between low-energy and low-carbon buildings. While low-energy buildings focus on reducing energy demand during operations, zero-carbon buildings take a more holistic view—addressing emissions across the entire lifecycle, from material production to demolition. Recognising this difference is essential for designing effective sustainability strategies.

To guide this transition, buildings are increasingly classified based on their energy performance. These range from green buildings, which prioritise resource efficiency and environmental protection, to ultra-low energy and near-zero energy buildings, which significantly reduce energy demand through advanced design strategies. At the highest level are zero-energy buildings, which generate as much energy as they consume annually through renewable sources.

Achieving these standards requires an integrated approach that combines passive and active design strategies. Passive design focuses on optimising natural resources—such as building orientation, insulation, natural lighting, and ventilation—to reduce energy demand. Active strategies, on the other hand, involve efficient mechanical and electrical systems, renewable energy integration, and intelligent building management technologies.

Equally important is the role of data-driven design and simulation. Advanced modelling tools enable precise assessment of energy performance, allowing designers to set measurable targets and optimise systems before implementation. This ensures that buildings meet both environmental and economic goals over their lifecycle.

Real-world applications demonstrate the value of this approach. Through systematic retrofitting and intelligent system upgrades, existing buildings can significantly improve energy efficiency, reduce operational costs, and enhance occupant comfort. These transformations highlight that sustainability is not limited to new developments—existing infrastructure holds immense potential for impact. As the construction sector continues to evolve, the shift towards low-energy and low-carbon buildings will be instrumental in meeting global climate goals. The challenge lies not only in adopting new technologies, but in rethinking buildings as integrated systems—where design, performance, and sustainability work in harmony.

The future of sustainable cities will be defined not just by how we build—but by how efficiently our buildings perform.

Environics — Transforming Spaces, Safeguarding Lives

In an era where invisible threats from our rapidly digitalising world quietly impact health, productivity, and wellbeing, Environics stands as a pioneering force dedicated to creating safer, healthier spaces for people to live, work and thrive.

At the heart of Environics is a deep commitment to enhancing human wellbeing by addressing both unseen environmental stressors and the emotional and physical effects they can have on individuals and communities. Their mission is simple yet powerful: to make every living and working environment healthier, safer and more productive.

Wellness Without Disruption

Environics' approach is unique. Instead of recommending costly structural modifications, they deliver measurable, non-invasive wellness solutions that protect people from hidden risks like electromagnetic radiation (EMR), geopathic stress, and digital overload — all without altering building layouts or interfering with technology performance.

Through a blend of scientific assessment, advanced technology and wellness-centric methodologies, their products and services are designed to improve immunity, enhance sleep quality, reduce stress and boost performance, safety and reliability — not just for individuals but for entire teams and organisations.

Impact Backed by Evidence

Environics' work spans thousands of projects across multiple countries and has positively influenced millions of lives in over 15 countries globally. Their solutions are scientifically and clinically tested, with certifications and research collaborations demonstrating effectiveness in reducing the harmful effects of EMR and environmental stress factors.

Their patented technologies and products (envirochip for mobiles, Laptops, etc.., Enviroglobe for Space EMR protection and Envirocare — are validated by renowned institutions, bringing credibility and confidence to organisations and individuals alike.

Healthy Environments, Happier People

Whether it's improving sleep quality at home, creating healthier workplaces, or enabling safer use to technology, Environics blends holistic wellness insights with practical solutions. Their work isn't just about reducing risks — it's about nurturing an environment where people are less stressed, more focused and empowered to perform at their best.

In a world where so much of our environment is unseen but deeply felt, Environics offers clarity, protection and measurable wellbeing outcomes — aligning perfectly with the values of sustainability, health and future-ready living.

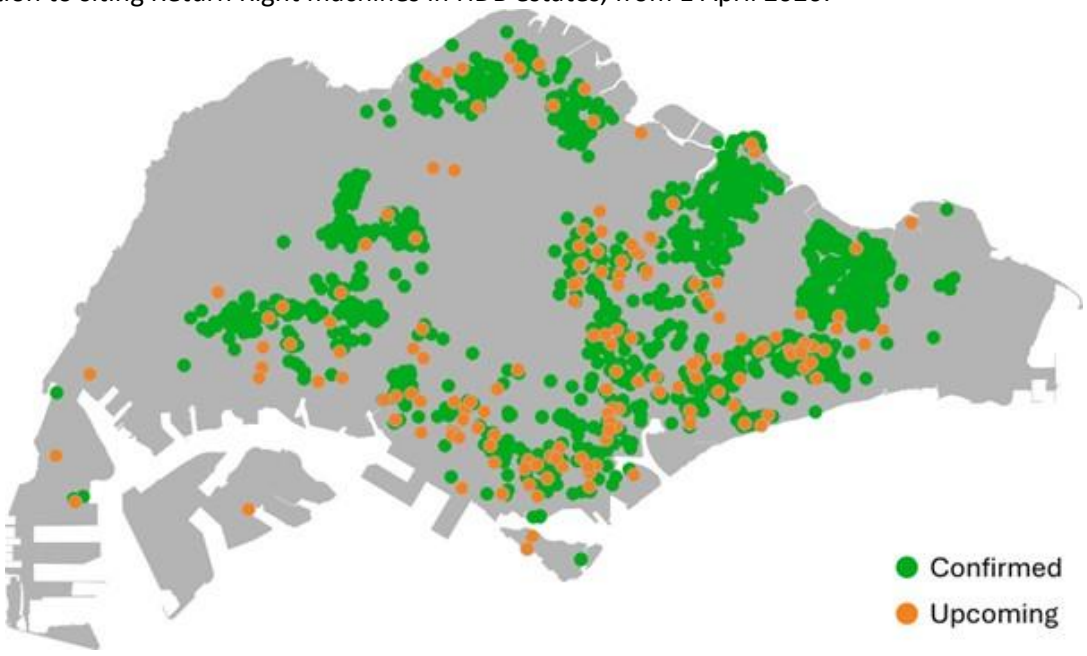
Return Right - The Beverage Container Return Scheme

Singapore's Beverage Container Return Scheme (BCRS), known as **"Return Right"**, will commence on 1 April 2026. "Return Right" encourages consumers to return their empty plastic and metal beverage containers at designated return points across Singapore, a significant milestone in Singapore's transition towards a circular economy and sustainable waste management.

Ensuring "Return Right" return points are accessible to consumers

The deployment of Return Right machines is on track. 1,070 machines to be deployed across Singapore from 1 April 2026. Based on this initial deployment, over 90 per cent of HDB households will be within five-minute walk of a machine. From 18 March 2026, consumers can visit returnright.sg to find their nearest Return Right machine. Besides showing the locations of the Return Right machines at launch, the website also includes locations of approximately 160 upcoming Return Right Machines that will be deployed progressively in the coming months as more beverage containers with the deposit mark enter the market.

Here is how BCRS Ltd. is working to make "Return Right" points accessible to more consumers, in addition to siting Return Right machines in HDB estates, from 1 April 2026:



- **More than 430 supermarkets and retail outlets** will have Return Right machines in their premises.
- **More than 610 Town Council-managed areas** will have Return Right machines.
- **17** high footfall **hawker centres** will have a Return Right machine on-site at the start by 1 April 2026. Within the next few months, all hawker centres will have either an on-site Return Right machine or have access to a machine nearby.
- In the coming months, **each institute of higher learning** will have at least one Return Right machine on-site.
- For **industrial areas**, 36 locations with high footfall areas will have Return Right machines deployed in the coming months, with additional locations to be identified based on the return rate and footfall patterns of workers in industrial areas.

● Plans are also underway for Return Right machines to be available at **large migrant worker dormitories and all recreation centres**.

The scheme operator, Beverage Container Return Scheme (BCRS) Ltd. will monitor return patterns and gather feedback from the community to determine optimal placement for new return points, ensuring the network continues to meet consumer needs effectively. Consumers can provide their suggestions through the website. The feedback will provide valuable inputs for BCRS Ltd. as the number of return points will double to 2,000 within the first year of implementation.

Nationwide network of return point operators for consumer's convenience

To support the nationwide rollout of "Return Right", BCRS Ltd. has appointed three industry partners with expertise in sustainable recycling solutions as Return Point Network Operators — RVM Systems, SG Recycle and TOMRA. These operators will supply and manage the entire network of Return Right machines across Singapore, handling end-to-end deployment and operations at supermarkets and community locations. This includes installing and maintaining the machines, ensuring uptime and reliability, and managing the collection of returned containers to deliver a seamless experience for the public.

Return Right machines will be cleared daily, with regular preventive maintenance carried out to ensure reliability and minimise downtime. Consumers can contact +65 6035 5882 or email hi@returnright.sg to provide all general feedback, including if the machines are out of order. For the convenience of customers, the returnright.sg website will give an indication of the Return Right machines' capacity status and their operating hours.

While the three operators may deploy different machines, the consumer experience will remain consistent across Singapore. All Return Right machines will recognise eligible beverage containers, provide refunds, and follow standardised operating procedures. BCRS Ltd. has worked closely with the Return Point Network Operators to align the user interface to provide four official language options – Malay, Mandarin, Tamil and English for all Return Right machines to ensure a seamless experience.

Special concession for micro producers

BCRS Ltd. acknowledges that the transition to the BCRS affects producers differently based on their size, production volume, and supply chain logistics. While many producers are well-positioned for this change, BCRS Ltd. recognises the administrative and resource challenges faced by micro producers who import a wide variety of beverage products at relatively small volumes. To assist producers, especially the micro producers, during this transition, NEA earlier announced the Producer Transition Grant, providing up to $2,500 to producers who register with BCRS Ltd. before 1 April 2026. This grant is designed to offset costs such as product registration fees, producer fees, and the cost of scheme stickers.

To support these businesses, BCRS Ltd. is introducing a special registration concession for eligible micro producers, removing the requirement to register individual products (SKUs) for those supplying fewer than 50,000 units of beverage products annually. This concession will apply to aluminium cans for a start. BCRS Ltd will continue to work with all producers to ensure the scheme is implemented effectively and efficiently.

Eligible micro producers may purchase up to 50,000 pre-serialised stickers each year under the BCRS as a substitute for individual product registration. These pre-serialised stickers, which are unique to

each micro producer, include the Deposit Mark and a 2D matrix to ensure consumers can successfully receive their deposit refunds. The Beverage Container Return Scheme Producer Transition Grant can be used to cover the cost of these stickers. Based on engagements with micro-producers, the estimated number of companies that qualify for this concession is between 50 and 100.

In line with the extended transition period ending 30 September 2026, the sticker quota for the first BCRS year (covering 1 October 2026 to 31 March 2027) will be prorated. For example, the available quota for this six-month period will be 25,000 stickers. NEA and BCRS Ltd. remain committed to engage producers of all sizes, offering practical support to facilitate their onboarding to the BCRS.

"Return Right F&B Scheme (RRFS)"

On 3 March 2026, the National Environment Agency (NEA) introduced the “Return Right F&B Scheme (RRFS)” for food and beverage (F&B) outlets with dine-in service. Under the RRFS, participating restaurants and food shops collect beverage containers from dine-in customers without charging the 10-cent deposit. Since sign-ups opened on 3 March 2026, the reception from the F&B operators has been encouraging with steady sign-ups from various types of F&B operators. This demonstrates industry support for “Return Right” and recognition of the important role F&B operators play in making the scheme successful.

Overview of consumer journey

For consumers to successfully claim their full 10-cent deposit, they would need to ensure that the empty beverage containers feature the Deposit Mark. The containers should not be crushed, and the barcode should remain intact. Return Right Ambassadors will be deployed at Return Right machines at selected times to assist members of the public who require assistance in the return process.

GREEN IN FUTURE

Green In Future is a novel venture of like-minded professionals with achieving a sustainable future as the target. Among the many services provided, the diffusion of technology to as many as possible and as far as possible, educating and generating awareness by being the link between the producer and the user, giving adequate training to the interested to adopt an innovation in Urban Landscaping, Urban farming, Education, Environmental issues and Health etc. are in the forefront.

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