Factsheets

ANNEX A - FACTSHEET FOR THE DESIGN PROTOTYPING FOR DECARBONISATION (DPFD) CONSULTANCY STUDY

ANNEX B - FACTSHEET ON SGBC-BCA LEADERSHIP IN SUSTAINABILITY AWARDS (LSA) 2026

ANNEX C - ABOUT GO 25: MAKING COMFORT SUSTAINABLE

ANNEX A: FACTSHEET FOR THE DESIGN PROTOTYPING FOR DECARBONISATION (DPFD) CONSULTANCY STUDY

Background

1. Currently, best-in-class green buildings can achieve 72% Energy Efficiency (EE) improvement from 2005 levels. To accelerate our efforts to achieve SGBMP's target of 80% EE improvement by 2030, BCA commissioned the Design Prototyping for Decarbonisation (DPfD) consultancy study to assess if the aspirational goal of the Singapore Green Building Masterplan (SGBMP) of achieving 80% energy efficiency improvement over 2005 levels is technically feasible and commercially viable across various building typologies.

2. The DPfD Challenge was a 6-month consultancy study that required each of the appointed consultants to partner a building owner and explore decarbonisation pathways to bring the selected building towards 80% EE improvement. Three building typologies were studied in the DPfD Challenge by four consultants:
    a. Arup Singapore Pte Ltd for an existing hotel;
    b. Building System and Diagnostics Pte Ltd for a new mixed development (office & retail), and
    c. Gensler Singapore Pte Ltd for an existing office building;
    d. GreenA Consultants Pte Ltd for a new office building.

3. The consultancy teams adopted the following approach in their study:
    a. Conduct a technology scan and identify innovative solutions that are technically feasible and commercially viable,
    b. Conduct energy modelling and simulation to determine the improvement in energy efficiency;
    c. Conduct cost-benefit analysis and thermal comfort analysis, and
    d. Identify any potential challenges and key considerations to implementing these strategies and technologies for high-rise commercial office, hotel and mixed development buildings.

Outcome of study and launch of DPfD e-publication

Key Question: Is 80% Energy Efficiency improvement over 2005 levels possible?

4. The consultancy study concluded that **achieving 80% EE improvement over 2005 levels is technically feasible for new and existing offices, new hotels[1] and new mixed-use developments.**
5. The study identified incremental decarbonisation pathways towards 80% EE improvement, designed to accommodate varying financial, operational, and technical considerations across different buildings. The decarbonisation pathways include:

	Quick Wins	**Best in Class**	**Emerging Best in Class**
Description	Commercially ready technologies with reasonable capital expenditure, short payback periods, and minimal disruption to building operations.	Technologies requiring moderate capital expenditure with longer payback periods, where implementation may involve some operational disruption. However, technologies in this class can help building owners achieve considerable EE improvements and could be addressed through timely asset enhancement initiatives (AEI).	Innovative technologies that may require further research before reaching maturity and wider market adoption. These technologies, while more novel in nature, may be what is required to overcome existing constraints and close the remaining gap towards 80% EE improvement.

[1] The consultants also carried out a desktop study and modelling of a best-in-class new hotel building through innovative passive designs, active strategies and alternative cooling technologies to overcome the challenges of spatial limitations of existing hotels.

In addition, 2 insights were surfaced as key to achieving 80% EE improvement:

Key Insight #1: Collaboration with stakeholders through plug load management

The DPfD study highlighted the importance of engaging and collaborating with tenants to monitor and manage their own energy use. Tenant plug loads form a significant part of total building energy consumption and may limit the extent of EE improvement achievable by building owners alone. One of the ways to manage tenant's plug load would be to incorporate sub-meters and green leases. These measures enable building owners and tenants to jointly track energy consumption, agree on mechanisms to track and reduce plug load consumption and share cost savings. Early engagement of tenants, operators, facilities management teams and other stakeholders is important to ensure that proposed measures are practical, sustainable and acceptable.

Key Insight #2: Alternative Cooling Technologies (ACTs)

ACTs, such as Passive Displacement Cooling (PDC) and Hybrid Cooling, play a crucial role in achieving thermal comfort and space cooling while significantly reducing building energy consumption. The study showed that conventional efficiency measures may not be sufficient on their own to achieve the 80% EE improvement target, particularly in buildings with high cooling loads. ACTs can help to reduce cooling demand by enabling higher set point temperatures while maintaining thermal comfort through improved air movement and more efficient cooling distribution.

GBIC-Demo: The Clifford at Raffles Place (The Clifford)

Singapore Land Group (SingLand) has submitted a Green Building Innovation Cluster (or GBIC) Demonstration application to adopt high efficiency lighting solutions and promote plug load management systems in its office floors, with a target to raise The Clifford's energy efficiency performance from 65% to 75% compared to 2005 baseline. SingLand will also be test-bedding Passive Displacement Cooling (PDC) solutions in the building's retail space to assess its viability prior to scaling up.

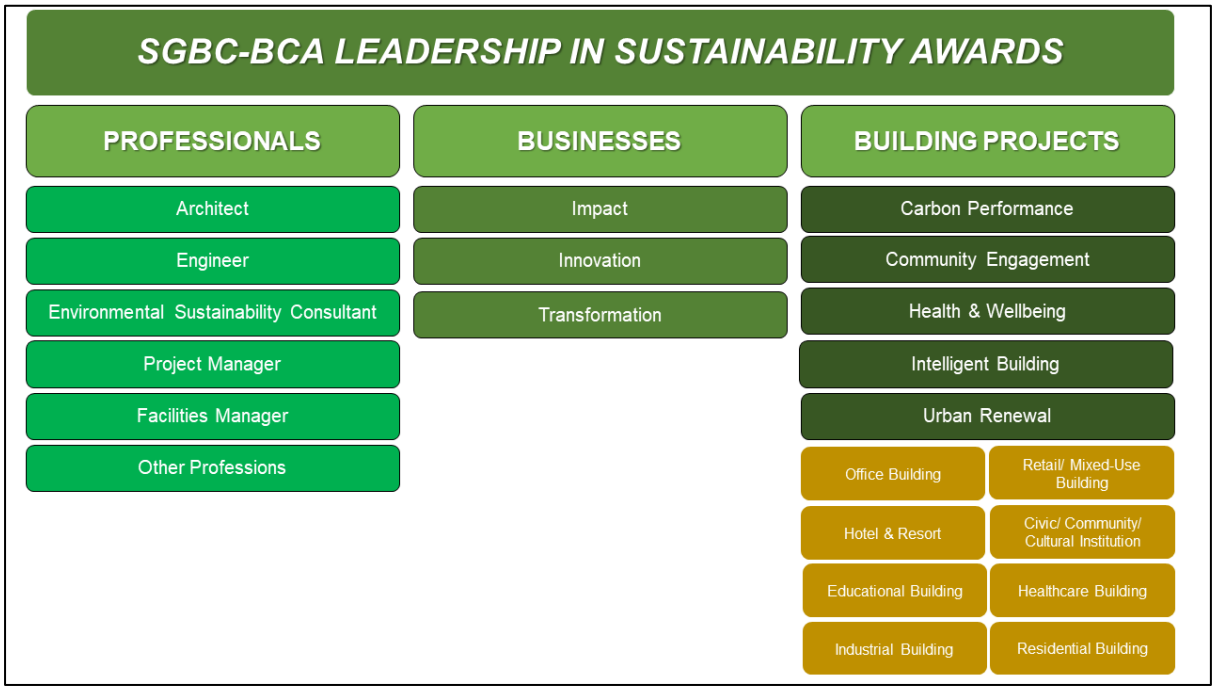
The Clifford at Raffles Place (The Clifford) is a redevelopment project for a 35-storey commercial building with 3 levels of retail space and a total GFA of 52,041.62 sqm.

ANNEX B: FACTSHEET ON SGBC-BCA LEADERSHIP IN SUSTAINABILITY AWARDS 2026

Background on the award

This is the built environment sector's premier platform to recognise exceptional leadership: the inspirational Professionals, groundbreaking Building Projects, and transformative Businesses building a greener, more resilient Singapore. More than an accolade, the Awards set the benchmarks for excellence. It is where the built environment sector's most influential professionals, green building projects and businesses receive the highest distinctions for sustainability leadership.

Award Categories



Professional Leadership in Sustainability

The Professional Leadership in Sustainability Award recognises exceptional Green Mark Professionals who have demonstrated outstanding leadership, innovation, and commitment in advancing sustainability within Singapore's built environment. The Award seeks to honour professionals whose personal vision and drive have created lasting impact, pushed industry boundaries, and accelerated Singapore's journey toward a greener future This Award celebrates transformative leadership, not just job performance. It is for those who have gone

above and beyond to champion change, influence the industry, and leave a legacy of sustainability excellence.

The Award is open to Green Mark Professionals in built environment and sustainability related fields e.g. Architects, Engineers, Environmental Sustainability Consultants, Project Managers, Facilities Managers and other Green Building Professions. In recognition of accomplishment in the foundational years of their career, Winners below the age of 40 (as of 1 Jan. 2026) will be presented with the Emerging Professional Award.

Business Leadership in Sustainability

The Business Leadership in Sustainability Award honours companies and organisations that demonstrate exceptional commitment, strategic innovation, and measurable impact in advancing green building practices and sustainability within Singapore's built environment. This Award recognises corporate leadership that not only achieves internal excellence but also elevates industry standards and accelerates the broader market transformation toward a sustainable future.

Award Sub-Categories

- IMPACT - Leadership Through Integration & Results
    - For organisations that have deeply embedded sustainability into their core business strategy and operations, delivering consistent, measurable, and industry-leading environmental and social outcomes.
    - For companies with mature ESG frameworks, outstanding green building portfolios, robust tracking systems, and proven stakeholder engagement that drives real-world change.
- INNOVATION - Leadership Through Solutions Development
    - For organisations that have developed or significantly advanced novel technologies, products, services, or business models that solve critical sustainability challenges in the built environment.
    - For product manufacturers, technology firms, consultancies, or service providers with groundbreaking solutions that have been validated and adopted in the market, delivering superior environmental performance.

- TRANSFORMATION - Leadership Through Strategic Change
    - For organisations that have undergone a fundamental, strategic shift to place sustainability at the core of their business, transforming their culture, operations, and market position.
    - For companies that can demonstrate a clear "before and after" journey, showcasing intentional change management, renewed corporate vision, and tangible outcomes from their sustainability-led transformation.

Building Project Leadership in Sustainability

The Building Project Leadership in Sustainability Award recognises outstanding green building projects that demonstrate leadership, innovation, and transformative impact in advancing a greener, more sustainable built environment in Singapore. This category honours developments that exemplify sustainability across different achievement areas and building types.

The Building Project must be located in Singapore, have at least one year of verified operating data and must have attained the highest Green Mark rating for the corresponding building project typology (Green Mark Platinum, Green Mark Platinum Super Low Energy, Green Mark Platinum Zero Energy, Green Mark Platinum Positive Energy).

Submissions are evaluated on:

A. Award Sub-Category: the core sustainability achievement for which the building project is assessed
B. Building Typology: the functional classification of the building project

Award Sub-Categories

A. CARBON PERFORMANCE

- Building projects demonstrating measurable leadership in carbon reduction and climate action.
- Submissions demonstrate exceptional energy efficiency, innovative low-carbon materials, embodied carbon reduction strategies, renewable energy

integration, and comprehensive carbon accounting throughout the building lifecycle.

- Judging focus: Quantifiable carbon savings, innovation in decarbonisation approaches, and scalability of solutions.

B. COMMUNITY ENGAGEMENT

- Building projects that excel in creating social value and inclusive stakeholder partnerships.
- Submissions demonstrate meaningful community co-creation processes, programmes that enhance social equity, public space activation, stakeholder education initiatives, and designs that foster community identity and belonging.
- Judging focus: Depth of engagement, social impact measurement, and long-term community benefit.

C. HEALTH & WELLBEING

- Building projects that prioritise human-centric design and occupant wellness.
- Submissions demonstrate superior indoor air quality, abundant natural light, biophilic design elements, acoustic comfort, thermal comfort optimisation, wellness amenities, and designs supporting physical and mental health.
- Judging focus: Health outcome considerations, indoor environmental quality metrics, and holistic wellbeing integration.

D. INTELLIGENT BUILDING

- Building projects that showcase technological innovation and smart building excellence.
- Submissions demonstrate advanced building management systems, IoT integration, predictive analytics, smart grid connectivity, digital twin implementation, automated performance optimisation, and data-driven facility management.

- Judging focus: Innovation level, system integration, operational efficiency gains, and technological scalability.

E. URBAN RENEWAL

- Building projects that transform and revitalise existing urban fabric with sustainability leadership.
- Submissions demonstrate adaptive reuse of structures, heritage conservation integrated with sustainability, neighbourhood-scale revitalisation, brownfield redevelopment, and designs that enhance urban resilience while respecting cultural context.
- Judging focus: Transformation impact, heritage integration, contextual sensitivity, and community revitalisation.

Building Typology

Submissions are assessed based on the selected typology that best represents the project's primary function:

A. Commercial Office Building – Corporate offices, business parks, co-working spaces
B. Civic/ Community/ Cultural Institution – Museums, libraries, community centres, places of worship, performance venues
C. Educational Building – Schools, universities, training centres
D. Healthcare Building – Hospitals, clinics, medical centres, aged care facilities
E. Hotel & Resort Building – Hotels, serviced apartments, resorts, hospitality venues
F. Industrial Building – Factories, warehouses, data centres, laboratories, specialised industrial buildings
G. Retail/ Mixed-Use Building – Shopping centres, retail complexes, mixed-development projects
H. Residential Building – Condominiums, apartments, landed housing developments, co-living spaces

The full list of winners and their quotes can be found here.

More info on winners that adopted Alternative Cooling Technologies

Hybrid Cooling System

7. Hybrid Cooling is one of the most accessible ACT options for existing buildings, offering cooling energy savings of up to 35% with a payback period of as low as four years.

8. A Hybrid Cooling System operates at higher indoor temperature setpoints — typically between 25.5°C and 27°C, compared to the conventional 23°C to 24°C — and supplemented by fan-assisted, increased air movement to achieve occupants' thermal comfort.

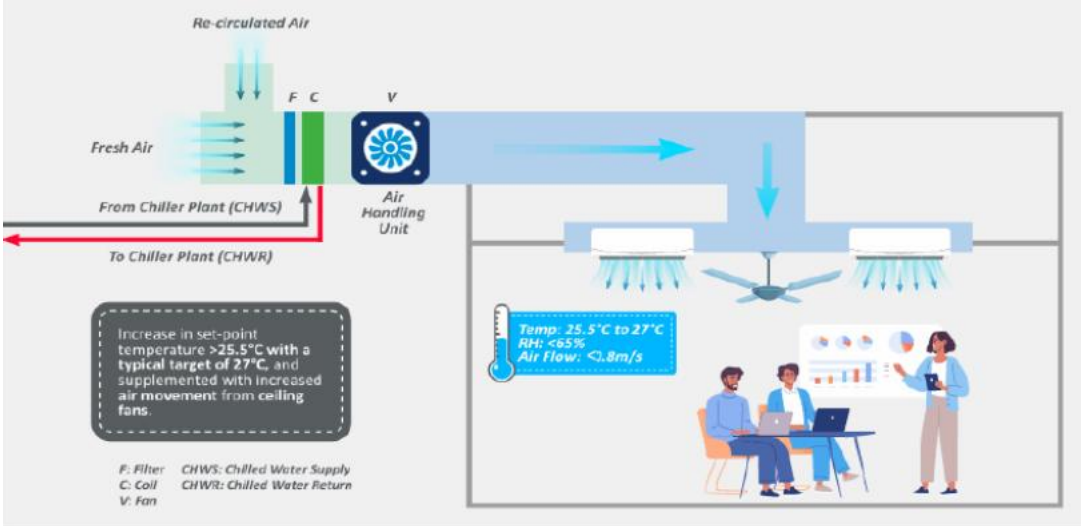


Figure 1: Hybrid Cooling System Set-Up.

Case Study: The GEAR (Building Projects – Carbon Performance category winner)

9. The GEAR integrates passive and active strategies to achieve exceptional energy efficiency and occupant comfort in the tropics. The building utilises an innovative cooling system comprising high-performance radiant cooling panels that double as sound absorbers, and ductless dehumidified outdoor air ventilation. Ceiling fans were installed to enhance airflow across workspaces, forming an energy-efficient hybrid cooling approach that enhances indoor comfort. To further reduce cooling load, The GEAR introduced a semi-outdoor space, K/PARK, which demonstrates the feasibility of achieving thermal comfort through natural ventilation in tropical climates. Operating with high ceiling fan speed,

K/PARK achieves comfort levels comparable to air conditioning at 28°C, with energy consumption 94% lower than air conditioning at 26°C.

10. Together with other sustainable design features and technologies such as AI optimisation, the building achieved a 45% reduction in energy consumption compared to reference buildings, with most occupants perceiving the workplace as both productive and supportive of well-being.

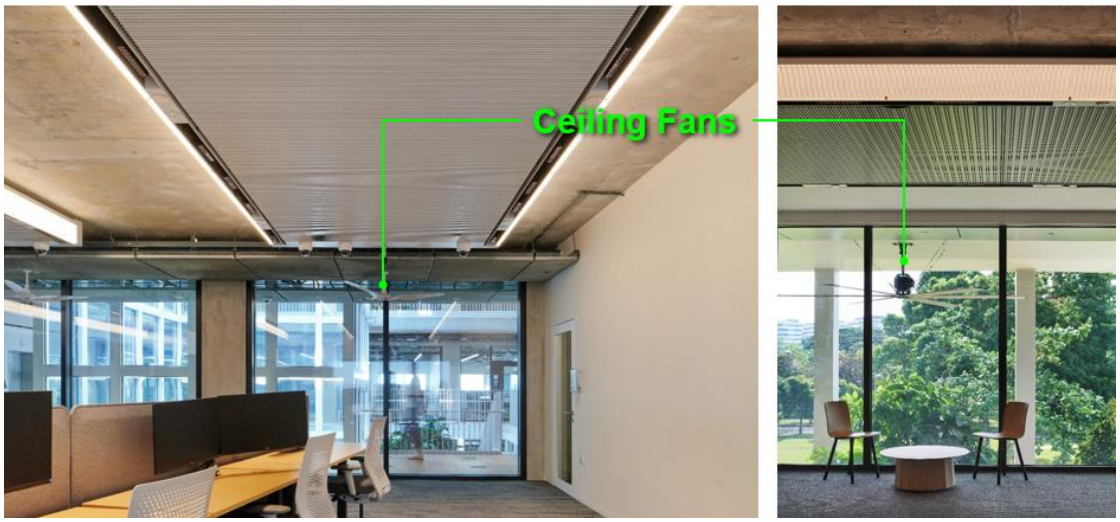


Figure 2. Hybrid Cooling at The GEAR.

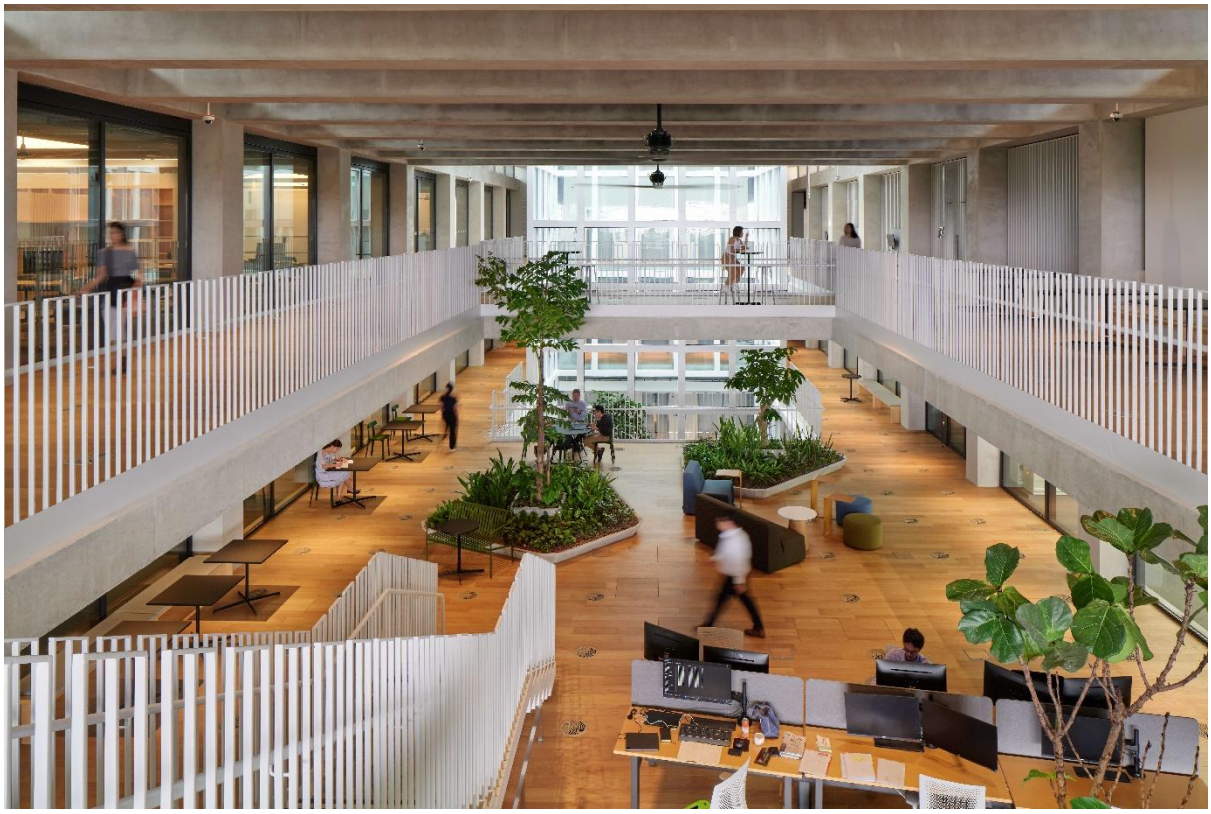


Figure 3: Semi-Outdoor Space, K/PARK (Photo credit: Daichi Ano)

Passive Displacement Cooling

11. Passive Displacement Cooling (PDC) leverages on convection currents to cool indoor spaces. Cool air is gradually warmed by surrounding heat sources and rises to the ceiling, where it passes through cooling coils to bring the temperature back down, causing the denser cooled air to sink. This creates a continuous, self-sustaining cooling cycle.
12. PDC is particularly well-suited for new buildings, offering up to 50% cooling energy savings with a payback period of as low as five years. It also reduces maintenance costs by eliminating the need for air-side equipment upkeep.

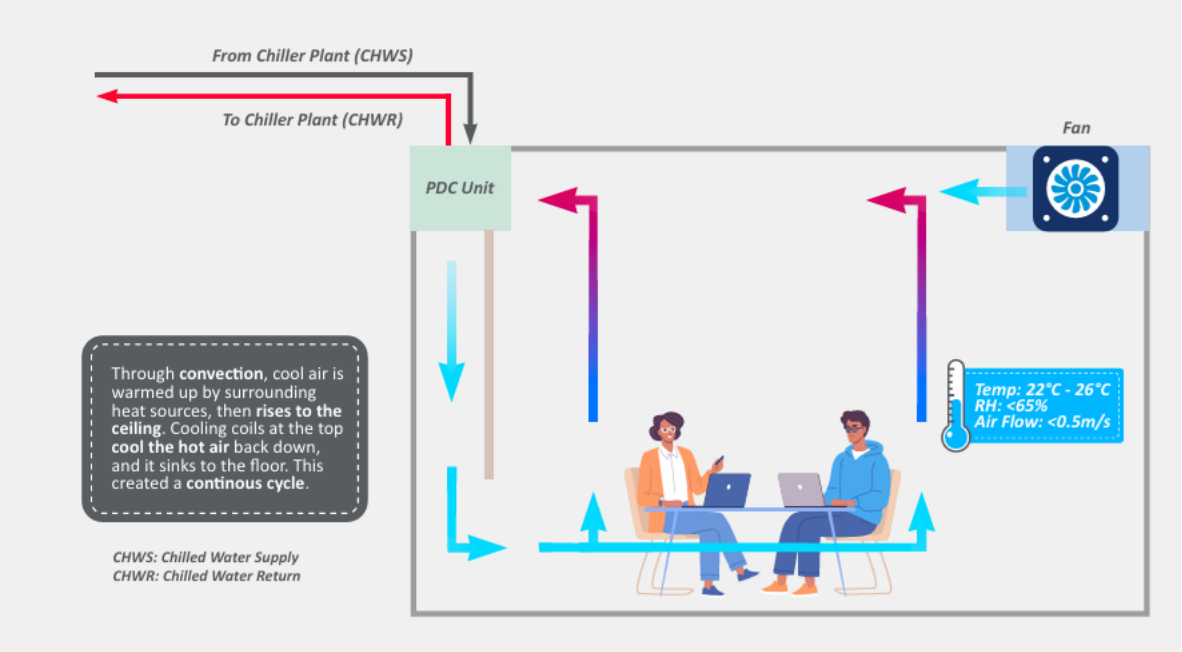


Figure 4: PDC System Set-Up.

Case Study: The Greenhouse at Dulwich College (Singapore) (Building Projects – Carbon Performance category winner)

13. The Greenhouse at Dulwich College (Singapore) has extensively deployed PDC across classrooms, auditorium, and collaborative spaces, achieving an air-distribution efficiency of 0.1 kW/RT, representing a 49.5% reduction in energy use compared to the baseline — translating to approximately 38,300 kWh in energy savings for the air-distribution system alone. Notably, no cost premium was observed for the PDC system compared to a conventional system, making it a cost-effective choice for new developments.

14. Since adopting PDC, clear benefits have been observed in both occupant comfort and the overall learning environment. The PDC system provides a more stable and evenly distributed thermal condition, reducing drafts and overcooling commonly associated with conventional air-conditioning. This has resulted in improved thermal comfort, particularly for students in classrooms and collaborative settings. Air quality has also improved, with better stratification and removal of heat and contaminants, creating a fresher indoor environment that supports concentration and wellbeing. From an

operational perspective, the quieter system enhances acoustic conditions in teaching spaces. The integration of PDC aligns with the College's sustainability ethos, increasing awareness and engagement among students and staff.

Figure 5: PDC at Dulwich College auditorium (Photo credits: Jiwen, courtesy of DP Architects)

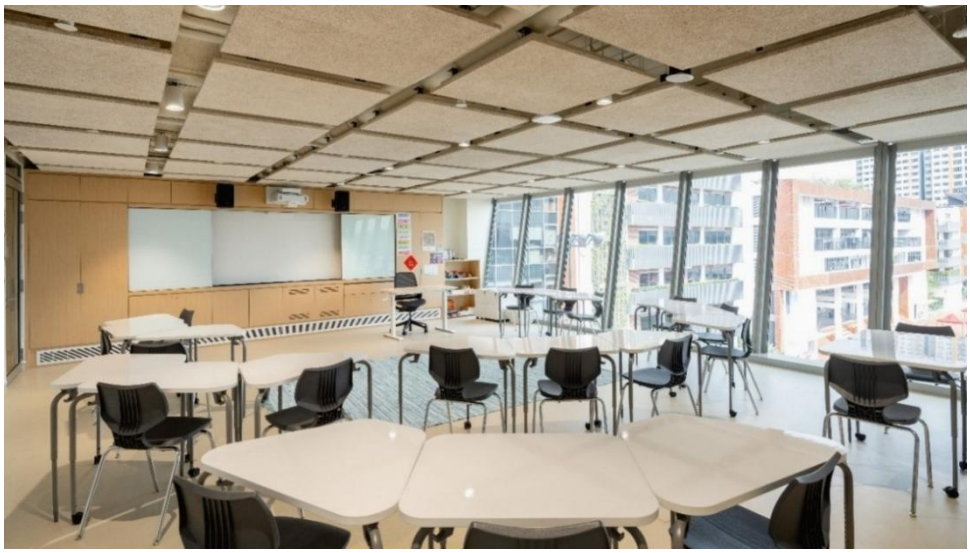


Figure 6: PDC at Dulwich College classrooms (Photo credits: Jiwen, courtesy of DP Architect)

Active Chilled Beam

15. Active Chilled Beam (ACB) systems provide both cooling and ventilation to indoor spaces through specially designed ceiling-mounted cooling units. Pre-cooled primary air passes through nozzles which induce air from the space upwards through the cooling coil of the chilled beam units. ACB is particularly well-suited for new buildings, offering up to 50% cooling energy savings with a payback period of as low as five years.

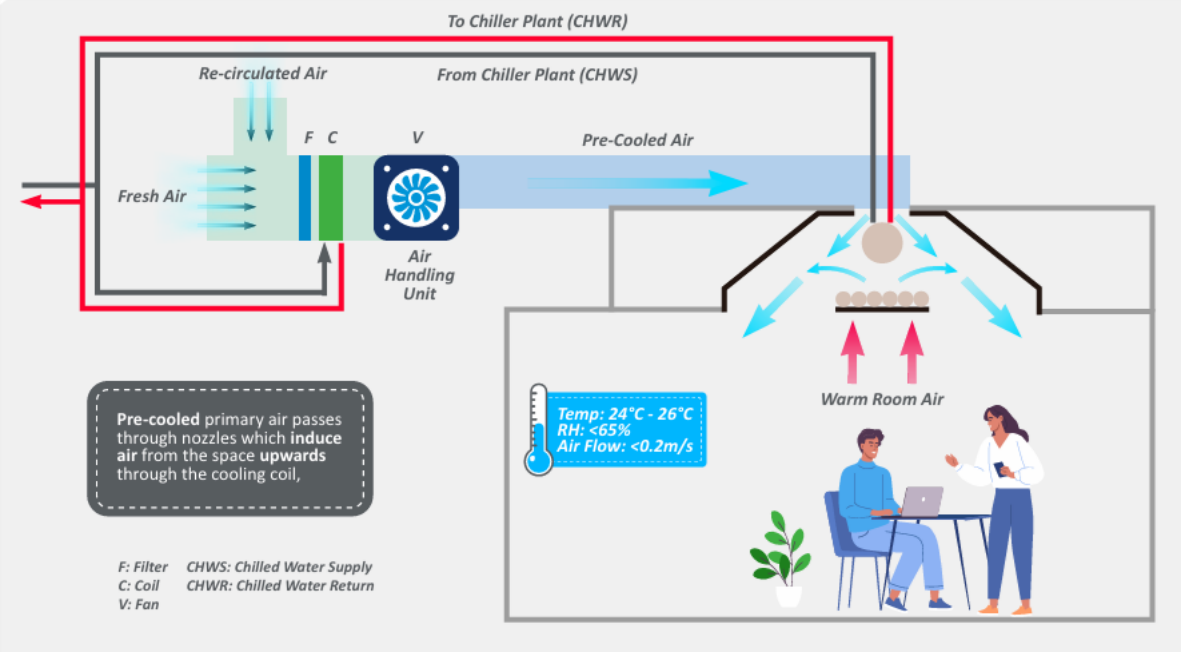


Figure 7: Active Chilled Beam System Set-Up.

Case Study: Paya Lebar Green (Building Projects – Intelligent Building category winner)

16. Paya Lebar Green has adopted Active Chilled Beam along its building perimeter, operating at elevated chilled water temperatures to optimise chiller efficiency. Combined with an interior VAV AHU system and supported by a high-efficiency dual-temperature chiller plant, the development has achieved cooling energy savings of 45%. The building has been awarded Green Mark Platinum Super Low Energy (SLE).

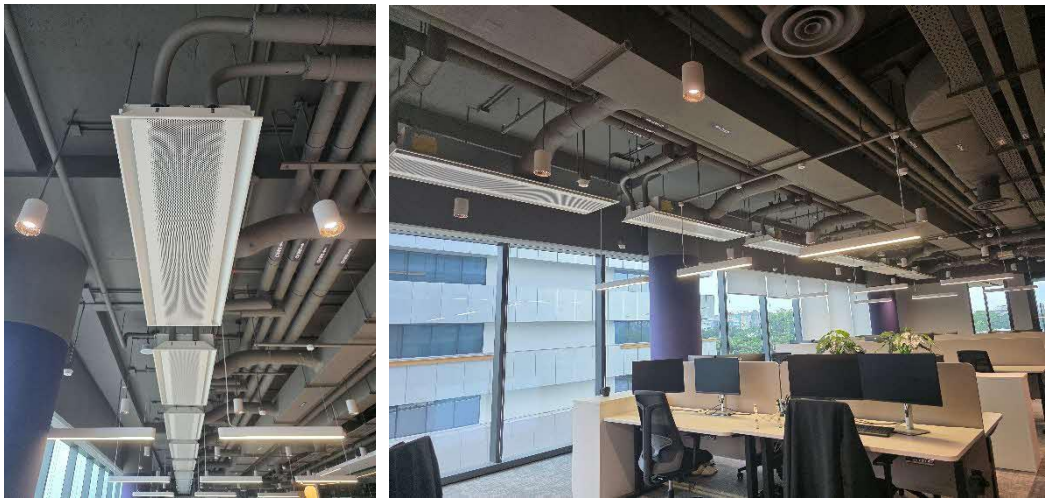


Figure 8: ACB installation at L-Acoustics office, Paya Lebar Green (Photo credits: Courtesy of DP Sustainable Design and DP Architects)

17. As of July 2026, at least 33 public buildings and 14 private buildings in Singapore have adopted ACTs. More information on ACTs including the technical references can be found at http://www.go.gov.sg/act-portal.

ANNEX C: ABOUT GO 25 - MAKING COMFORT SUSTAINABLE

Buildings account for over 20 percent of Singapore's carbon emissions, with air-conditioning being a key contributor to building energy consumption. Overcooling not only increases electricity usage but also accelerates climate change and exacerbates the urban heat island effect, creating a vicious feedback cycle where hotter cities demand more cooling, which generates more emissions and heat. In Singapore's tropical climate, breaking this cycle requires a collective shift towards sustainable cooling practices.

Go 25 is a national movement launched in May 2025 by the Singapore Green Building Council (SGBC) and the Ministry of Sustainability and the Environment (MSE), supported by the National Environment Agency (NEA) and the Building and Construction Authority (BCA). The movement encourages all Singapore residents to adopt optimal cooling practices by setting indoor air-conditioning temperatures at or around 25°C in their homes, offices, and buildings.

Why 25°C?

A growing body of research affirms the benefits of setting air-conditioning temperatures optimally:

- A study by Ngee Ann Polytechnic's Centre for Environmental Sustainability showed energy savings of up to **12 percent for each degree raised** in air-conditioning temperature from 23°C to 25°C in offices, and up to **28 percent in retail spaces**, with no reported increase in occupant discomfort.
- A study by BCA at its ZEB Plus building @ BCA Braddell Campus found that through hybrid cooling, **cooling energy savings of 32%** can be achieved when AC temperature is increased from 24°C to 26.5°C, without affecting occupant thermal comfort.
- The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 55 maintains that each 1°C increase within the comfort range of 20°C to 27°C will bring energy savings.

Go 25 Resources

SGBC has developed a comprehensive suite of resources to support organisations in their Go 25 journey. All resources can be accessed at **https://go.gov.sg/go25** .

RESOURCE	PURPOSE
Go 25 Pledge	Voluntary industry commitment to sustainable cooling; organisations commit to setting temperatures at 25°C, supporting stakeholders, and raising awareness
Go 25 Digital Toolkit	Digital assets including badge artwork, poster templates, social media templates, and infosheets for pledgees to communicate their commitment
Go 25 Indoor Comfort Snapshot	Summary report based on quiz data from 6,000+ Singaporeans, providing data-driven insights for business owners and building managers
Go 25 Industry Guide for Building Operations	Practical guide for facilities managers and building operators with technical recommendations, case studies, and implementation checklists
Go 25 Climate Appropriate Attire Guide (Office Edition)	NEW - Practical tips on what to wear in Go 25 indoor settings; addresses common occupant questions; provides useful information for individuals

Go 25 Climate Appropriate Attire Guide (Office Edition)

The **Go 25 Climate Appropriate Attire Guide** is a practical resource designed to help individuals feel comfortable and confident in indoor environments set to 25 degrees Celsius. Developed in collaboration with the Singapore Fashion Council, the Guide provides friendly, research-backed tips for dressing appropriately in Go 25 settings, in the office or other common places and spaces.

Key Recommendations:

- Smart Fabric Choices - Choose lightweight, breathable fabrics such as linen, cotton, ramie, Tencel, and bamboo viscose. These materials allow air to circulate and wick moisture away from the skin. For active or easy-care needs, moisture-wicking polyester or blended knits are excellent options.
- What to Avoid - Avoid heavy, dense fabrics like thick twill, wool blends, or standard polyesters that trap heat. Skip clothing with non-breathable linings or stiff interfacings (like fully fused suit jackets). Dark colours absorb more heat, lighter colours like white, pale blue, pastels, and beige stay cooler and look fresh.
- Outfit Suggestions - For office settings, opt for lightweight cotton, linen, or blended dress shirts and polos. Choose easy-fitting, relaxed silhouettes that let air circulate, think straight-cut trousers, easy-fit blouses, or unstructured jackets. A lightweight, unlined or half-lined blazer or cardigan can be kept on hand for cooler moments. Pair with breathable loafers, polished sneakers, or dress shoes with breathable linings.
- Laundry & Care Tips - Wash most items cold or warm and hang them up to dry. Use low-heat settings if using a dryer to help technical fabrics perform their best. Skip fabric softeners to preserve sweat-wicking properties. Build an office wardrobe with mix-and-match pieces—versatile layers, shirts, and separates, so you can adapt as needed.
- The Business Casual Look - A poplin or linen-blend shirt, paired with cotton-elastane chinos and light loafers or smart sneakers, creates a neat office look. For a more polished appearance, consider a half-lined linen-cotton or poly-lyocell blend suit with an unlined blazer.

The Guide emphasises that the best approach for Go 25 indoor environments is to dress in breathable, moisture-managing layers and choose relaxed but polished styles. Comfort and professionalism can absolutely go hand-in-hand in Singapore's climate.