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SEAB

SOUTHEAST ASIA BUILDING

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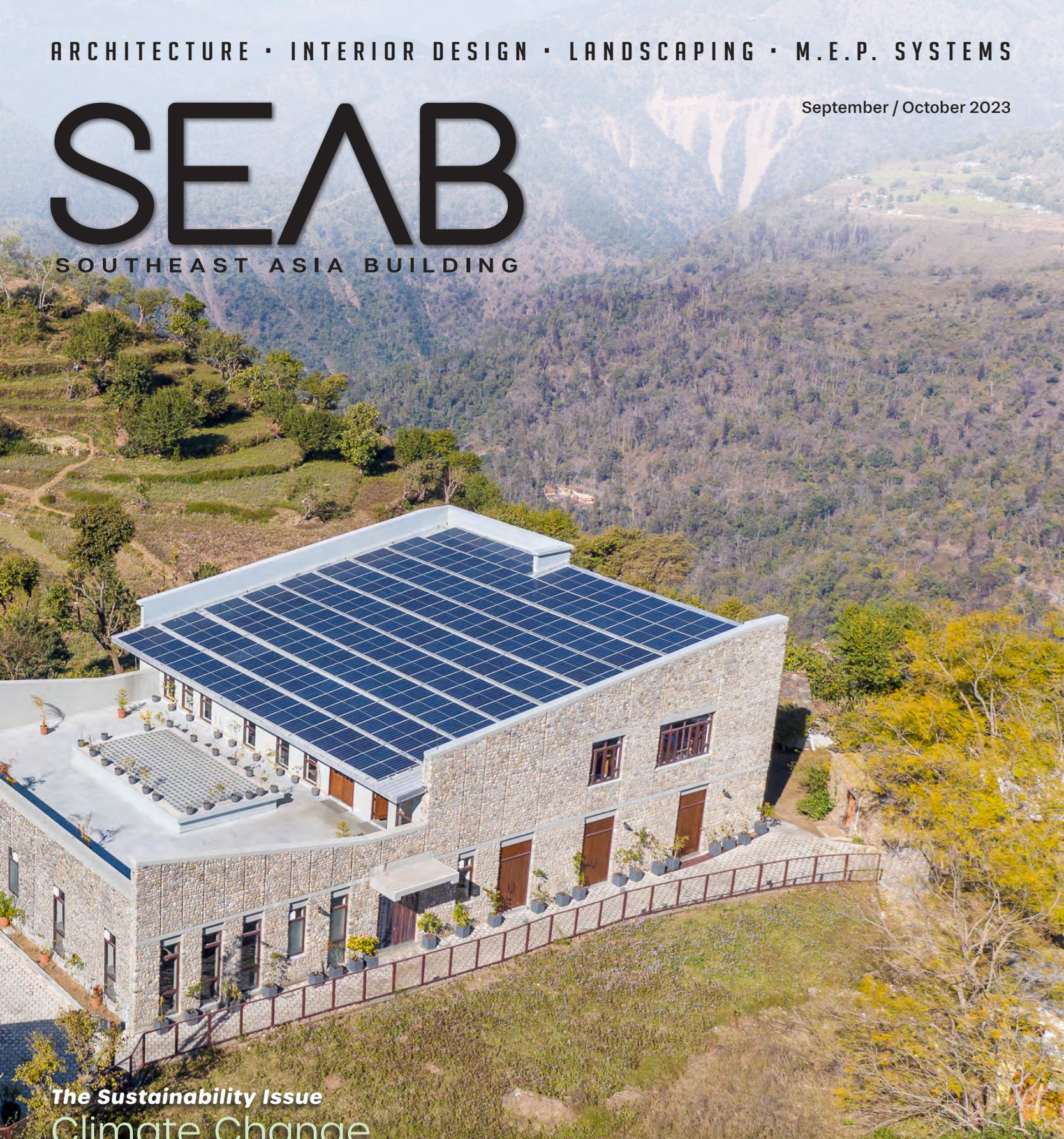

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Decarbonisation: What It Means To MEP Specialists

MEP plays a major role in tackling carbon emissions in the built environment. In this interview, experts from Cundall, a global multidisciplinary design and engineering firm, tells us how the MEP industry can play its part and the type of skills that professionals need to develop for future challenges. **Singapore Managing Director, Building Services of Cundall Marcus Kan, and Hong Kong Director of Cundall, Joe Tang, share their thoughts.**

SEAB: What does decarbonisation mean to MEP specialists?
MARCUS: There are two contributors (which we can directly influence) to the carbon footprint of a building – embodied carbon and operational emissions.

"When MEP specialists undertake design, we need to consider both these aspects of decarbonisation, and reduce them to the greatest extent current technology allows. Then we need to look at offsetting the balance through renewable energy systems with the aim to generate more than what is consumed.

Energy efficiency has been at the forefront of mind for many years, as it has been the best way to rapidly reduce emissions in any location where grid energy is generated by fossil fuels. We have seen the industry rapidly evolve new solutions in response to this, such as variable speed drives for pumps and fans, and smart control systems so air conditioning and ventilation can be responsive to actual conditions rather than relying on standard set points. As engineers, we do our best within the scope we can influence, which is the design. Power generation is becoming greener, but that is beyond our control, and it will take time for the grid to fully decarbonise. Therefore, we focus on doing as much as we can with design to make a positive impact.

The emerging focus now is embodied carbon, and the emissions associated with the entire lifecycle of a material or product. So as MEP engineers that means carefully considering design, specifications, procurement and installation and making decisions that reduce emissions at each point where we have an influence.

The engagement of engineers in the early stages of project design is crucial for overall success in decarbonisation, as the work of each discipline including architect and structural engineering has a direct influence on the design for building services including mechanical and electrical services.

SEAB: What role do MEP specialists have in decarbonising the built environment?
JOE: Building services, particularly mechanical, electrical and plumbing, sit at the nexus of the climate adaptation and mitigation challenge. On the one hand, MEP is absolutely critical to protect people's health and the function of the economy during extreme heat events and severe humidity, while on the other, the energy required to operate mechanical


Joe Tang

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> – **Joe Tang**

plant and the refrigerants in the systems can contribute to global warming unless we apply inventive thinking.

To achieve solutions that support decarbonisation, MEP specialists need to consider design and equipment specification in the context of the whole building, the infrastructure that supports it and the needs of human occupants. Rather than designing based on standard assumptions that mechanical plant and grid electricity will supply all of a building's needs, collaborating with other design disciplines including environmentally sustainable design expertise, façade engineers and architects, structural engineers and smart building engineers leads to integrated solutions that can minimise energy demand.

Increasingly, MEP engineers are factoring in optimised passive performance for heating, cooling and ventilation, so mechanical plant becomes supplementary, rather than primary. Refrigerants are another area where our work has major impact. By demonstrating low-GWP refrigerants are feasible and specifying for smart systems that can give real-time alerts to leaks, the impact of cooling both from fugitive refrigerant gases and spikes in energy use can be mitigated. As an industry we are also rethinking where cooling needs to be applied, with leading-edge approaches such as point-source cooling rather than volume conditioning for energy-intensive facilities such as data centres.

We also need to consider the end-of-life element of both the building and the plant and equipment lifecycle and the potential carbon impacts of decommissioning. Design, construction and installation processes that suit deconstruction and repair, re-use, refurbishment or recycling of valuable materials is now becoming something we consider in our engineering design work.

All of these new approaches to design challenge us in positive ways and show how our work can be of even greater benefit to society. Every time we achieve optimal energy efficiency, and work to integrate on-site renewable energy capacity and on-site water harvesting and reuse, there are benefits for the demand profile for grid electricity and mains potable water. In nations including Hong Kong and Singapore where there are land area limitations to installing solar at scale, and weather conditions do not support mass wind power deployment, reducing demand at source is key to a successful transition away from fossil fuels. MEP specialists are at the forefront of helping ensure this efficiency-led approach is achievable.

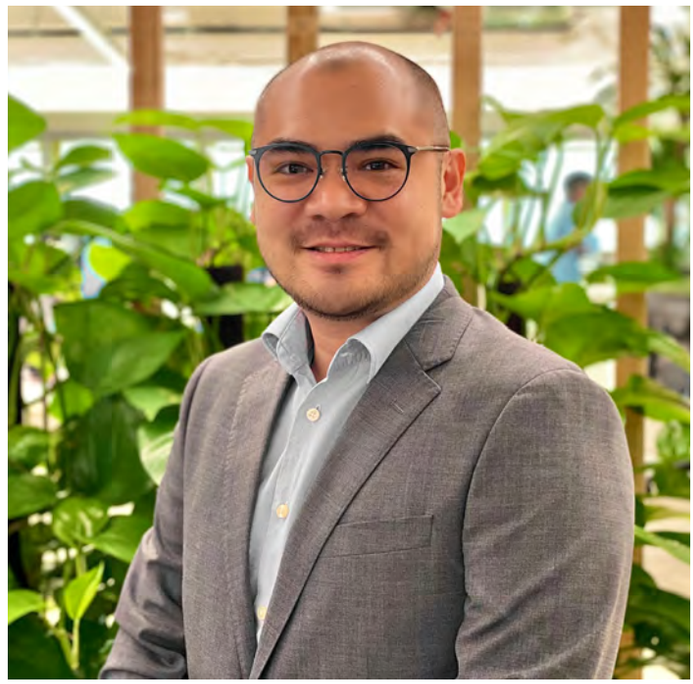
SEAB: What kind of skills do MEP specialists need to move to a net-zero future?

MARCUS: The exciting thing about the net zero trajectory is the tools and thinking we need to use to get there.

Our MEP engineers use digital engineering design in conjunction with modelling of climate, energy and indoor conditions to fine-tune design for energy-efficiency. We have transitioned to digital-first design, which means we can leverage the power of parametric modelling and building information modelling combined with embodied carbon calculators to really nail the detail of decarbonising building services. We can apply game theory in how we invent solutions, understanding that there are no 'wrong' answers in a simulation, and one of the powers of digital engineering is it allows us to 'fail' multiple times until we find the most optimised solution to a design challenge. This also enables engineers to be less risk-averse and frees us to challenge the norms to find the breakthroughs.

So, the skills with digital technology, design thinking, experimentation, holistic thinking and working with data and analytics are becoming very important for MEP professionals. I think this will also make the profession more attractive to young people, which is important, to bring the next generation of talent into the sector.

Also, because the net zero approach requires a holistic understanding of the performance of the building not only in terms of all the building systems and how they interact, but also how it will perform through time and in a changing climate, collaboration skills and communication skills are key.



Marcus Kan

> "The skills with digital technology, design thinking, experimentation, holistic thinking and working with data and analytics are becoming very important for MEP professionals."
> **– Marcus Kan**

Cundall sets out net zero carbon targets by 2030

Hong Kong – Multi-disciplinary engineering consultancy Cundall has committed to achieving net zero carbon on all global projects by 2030. The pledge recognises the critical need for practical, science-led action to transition all buildings, infrastructure, and human settlements to net zero carbon as rapidly as possible.

"We know that buildings are one of the fastest and most effective levers available for reducing greenhouse gas emissions. As the latest IPCC report stressed, there is no time to waste, and we must start now. That includes addressing our existing building stock as well as new buildings," said Julian Bott, Cundall Asia-Pacific Managing Director.

Cundall, which has 25 offices worldwide, will collaborate with its clients and industry to deliver energy and carbon solutions necessary to minimise the impact of global temperature rises. After 2030, Cundall will only work on design projects that are net zero carbon.

Treehouse. Rendering credit: Ronald Lu & Partners

Zero Carbon Design 2030

The Zero Carbon Design 2030 (ZCD2030) commitment is a line in the sand that has been two years in the making. It is both an internal cultural shift and a standpoint that will enable Cundall's engineers and designers to make zero carbon thinking 'business as usual' for all Cundall's people and its clients.

"When we began our Zero Carbon Design 2030 journey in 2021, we had to start from the ground up to understand exactly what it would entail," says Julian Sutherland, Partner at Cundall and part of the core team dedicated to the initiative's success.

New Net Zero Treehouse by Cundall

Cundall's Asian business (Hong Kong, Shanghai, Manila and Singapore) is building on its ground-breaking multi-disciplinary design for the award-winning Net Zero Carbon climate-adapted, biophilic workplace concept – Treehouse, to assist clients in achieving future-ready property assets.

"One of the most important lessons learned from developing the Treehouse concept was the crucial importance of every discipline working collaboratively," explains Cundall Hong Kong Director, Joe Tang.

Marcus Kan, Cundall Singapore Managing Director stresses that this is not only applicable to new buildings. "Many asset owners and portfolio managers recognise that their existing properties require assistance to improve energy efficiency, safety, occupant amenity and market relevance. We bring the same advanced thinking we applied to Treehouse to our Building Performance Services offering, which helps clients with transforming the buildings they currently have into the kind of high-performing buildings our global net zero future needs," said Marcus.

New elevator plant now fully operational in India

Tokyo, Japan – Fujitec India Private Ltd., a group subsidiary of FUJITEC CO., LTD., completed a second elevator plant in the suburbs of Chennai, which became fully operational in February of this year.

The second plant was built to grow sales in India, where demand is increasing, and to expand exports throughout South Asia. Upon completion, the plant provided more than double the previous production space for Fujitec in the country. In addition, construction was completed for a new 78.9-metre elevator research tower. Fujitec India is strengthening its development structure, including the development of high-speed elevator models, to meet the demand for elevators in India, where high-rise building construction is becoming more common.

Fujitec India plans to increase production capacity to 3,000 units per year by the end of 2023, 1.5 times the current 2,000 units. This increase in capacity is the company's response to strong sales of standard elevator models for the Indian domestic market. Fujitec pursues the further expansion of its global business under Fujitec's medium-term management plan Vision24, expanding geographic business reach and building up production capacity steadily.

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