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SANMU

DECARBONISATION FOR A RESILIENT FUTURE:
SHAPING A SUSTAINABLE TOMORROW

NET ZERO
CO_2

Prof Seeram Ramakrishna
Professor
National University of Singapore

Mr Alvin Ee Wei Liang
Research Fellow
National University of Singapore

Dr Jonathan Low
Professor
*SIMT/A*STAR*

Mr Sriman Ncvk
Business Development Director
Akila

Date: 30 August 2024, Friday

Time: 9am - 1pm

Venue: Raffles Town Club
1 Plymouth Ave, Singapore 297753
Ballroom, Level 1

Fees: $87.20 (IES / ASHRAE / CIJC Members)
$109 (Non Members)
(Inclusive of 9% GST)

CPD: 4 SGBC / 3 PDUs for PEs and CEngs
(Approved and Confirmed)

"Decarbonization for Resilient Futures: Shaping a Sustainable Tomorrow" advocates for reducing carbon emissions to build resilience for the future.

By transitioning to renewable energy sources and innovative technologies, we mitigate climate change's impact and fostering economic prosperity and social equity.

Ultimately, decarbonization offers a transformative pathway to a sustainable future, ensuring resilience, equity, and prosperity for generations to come.

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CIRCULAR ECONOMY - A MUST IN THE TOOL KIT OF DECARBONIZATION

Decarbonization goals have been pledged by governments and companies worldwide, focusing on energy efficiency, phasing out fossil fuels, and harnessing renewable energy. According to the United Nations Environment Program(UNEP) Global Resources Outlook 2024, 55% of greenhouse gas emissions and 40% of particulate matter health impacts are from material resource extraction and processing. Thus, decarbonizing material production and increasing material efficiency are crucial to mitigate climate change and pollution-related health impacts. UNEP recommends boosting circular economy (CE) business models, building CE capacity and coalitions, and decoupling resources from economic growth.

The circular economy mimics nature's self-balancing systems, enhancing resource efficiency and reducing socio-environmental harm. It involves designing products and processes with lower ecological footprints and higher circularity, fulfilling functional and cost requirements. This transition aims for zero-waste and zero-carbon.

This seminar covers CE principles, skills, regulatory frameworks, standards, business opportunities, impact investments, and strategies.

Prof. Seeram Ramakrishna, FREng, Everest Chair, is a world-renowned professor at the National University of Singapore. Recognized among the World's Most Influential Minds (Thomson Reuters) and Clarivate Highly Cited Researchers since 2014, he is a leading advocate for circular economy solutions. He moderates the Charles Rudd Distinguished Global Lecture series by The Institution of Engineers Singapore (IES) and is a chartered engineer in Sustainability. He serves as a POC for the Singapore Ministry of Sustainability and Environment (MSE) on circular economy, and is a member of various NEA and ISO committees.

He is an elected Fellow of several prestigious academies and societies worldwide, including the Chinese Academy of Engineering, National Academy of Engineering (India), Royal Academy of Engineering (UK), and others. He holds a PhD from the University of Cambridge and has furthered his research at Harvard, MIT, Johns Hopkins, and KIT, Japan.

His leadership roles at NUS include Vice-President (Research Strategy), Dean of the Faculty of Engineering, and Director of various NUS initiatives such as Enterprise, Industry and Technology Relations, International Relations, and Solar Energy Institute.

SUPPORTING DECARBONISATION IN THE BUILT INDUSTRIES

Decarbonizing the built environment is crucial due to escalating climate change, with the construction industry being a major carbon emitter. This presentation highlights the role of carbon accounting tools in reducing emissions within the sector. By quantifying the environmental impact of construction activities, these tools enable informed decision-making and mitigation strategies.

Various methodologies, from life cycle assessment (LCA) to embodied carbon assessments, provide insights into the carbon footprint of buildings and infrastructure, helping stakeholders identify emission reduction opportunities throughout project lifecycles. Real-world examples showcase the benefits of integrating carbon accounting tools into construction projects, demonstrating their role in enhancing efficiency and sustainability.

Addressing challenges like data availability and cost are essential for widespread adoption of these tools. Strategies to overcome these obstacles and promote sustainability within the built environment will be discussed, emphasizing the collective responsibility of industry stakeholders. This presentation underscores the transformative potential of carbon accounting tools in supporting decarbonization efforts.

Mr. Alvin Ee Wei Liang is a Research Fellow at the Energy Studies Institute, National University of Singapore, leading programs on Energy Consumption, Carbon Accounting, and The Circular Economy. He heads the Singapore-centric Embodied Carbon Calculator projects for New Buildings, Land Reclamation, and Mechanical and Electrical sectors. Previously, as a Research Associate at the NUS Environmental Research Institute (NERI), Alvin focused on Life Cycle Assessment (LCA) modeling for waste-to-material technologies and industrial symbiosis.

*Before NERI, he was a Research Engineer at the Institute of Chemical & Engineering Sciences (ICES), A*STAR, where he specialized in LCA modeling and sustainability assessments for pharmaceutical and chemical manufacturing. Alvin's notable achievements include receiving the IChemE award in 2016 for his work on the Development and Application of a Combined Approach for Inherent Safety and Environmental (CAISEN) assessment. He holds a Master's degree in Safety, Health and Environmental Technology from NUS and a Bachelor's degree in Chemical Engineering from Newcastle University.*

SHAPING SUSTAINABLE ORGANISATIONS THROUGH QUANTITATIVE MODELING AND ASSESSMENT

The vision of the Singapore Institute of Manufacturing Technology (SIMTech) is to be a world-class innovation partner in advanced manufacturing technologies, systems and capabilities. With climate change being a global challenge, the Sustainable Informatics and Strategy group at SIMTech aims to develop technologies that will help industries to decarbonize.

For individuals embarking on their sustainability journey and uncertain about prioritizing efforts, the Green Compass tool has been developed. This tool offers a thorough evaluation of an organization's sustainability maturity and proposes enhancements in key areas.

Additionally, assistance is provided in assessing environmental impact through life cycle assessments. These evaluations quantify the sustainability of technologies, systems, products, and services, identifying areas for improvement across the manufacturing value chain.

This presentation will delve into the research group's efforts, which aid companies in holistically assessing the sustainability maturity of their organization. It identifies key improvement areas based on rigorous technical criteria and aims to inspire proactive measures while equipping you with the technical expertise to initiate your organization's sustainability journey.

Dr. Jonathan Low is dedicated to helping businesses achieve sustainability. He leads a research team within the Sustainability Informatics & Strategy Group at A*STAR SIMTech, focusing on quantifying environmental sustainability through modeling and assessments. Their work aids businesses in making informed sustainability decisions while avoiding greenwashing.

Jonathan also spearheads the development of Green Compass™, an assessment and strategic roadmapping tool that guides companies toward sustainable transformation. In this role, he seeks to understand the unique challenges faced by companies of different sizes to ensure Green Compass™ remains relevant and effective.

With a PhD in Chemistry from Columbia University and over 10 years of research experience in sustainable materials and manufacturing, Jonathan's projects include accounting for GHG emissions from refrigerant use, using greener solvents for e-waste metal extraction, and developing efficient solar cell materials.

An experienced and ACLP-certified trainer, Jonathan has conducted sustainability training for numerous companies and within A*STAR. Through his efforts, he hopes to preserve snowy mountains for snowboarding and idyllic beaches for relaxation.

BEYOND BIM: UNVEILING THE POTENTIALS OF DIGITAL TWINS IN ENERGY EFFICIENCY AND FACILITIES MANAGEMENT

While BIM excels at creating detailed digital representations of buildings, digital twins go a step further. They act as real-time, dynamic counterparts to physical structures, incorporating sensor data, machine learning, and analytics to optimize building performance in areas like energy efficiency (EE) and facilities management (FM). Digital twins, in contrast, enable a proactive approach.

By continuously collecting and analyzing data from sensors embedded within the building, digital twins can predict equipment failures, optimize maintenance schedules, and minimize downtime. This translates to significant cost savings and improved operational efficiency for FM teams. The potential for EE is equally exciting. Digital twins provide real-time insights into energy consumption patterns, allowing facility managers to identify areas of inefficiency. By combining the power of BIM with real-time data and AI, digital twins offer a holistic approach to building management, promoting sustainability, cost savings, and improved occupant comfort.

Mr Sriman is proven leader in sustainable building design and energy management with a strong track record of delivering high-performance projects. Expertise in ESG, decarbonization, digitalization, and green building initiatives. Spearheaded significant decarbonization efforts for over 50 buildings using digital twinning and a proprietary BIM platform.

Delivered exceptional results: achieved LEED Platinum for 8 projects, LEED Gold for 7, and LEED Silver for 12, while navigating various green building rating systems. Established sustainability roadmaps that demonstrably reduced carbon emissions. Passionate communicator: delivered over 100 technical trainings and seminars, and supported skill development for consulting firms.