COOLESTSG WEBINAR - SUSTAINABLE AND ENERGY EFFICIENT DISTRICT COOLING SYSTEMS IN THE ASIA-PACIFIC

Date: Wednesday 27 July 2022
Time: 1500 - 1700 Hours
Venue: Zoom

The event is open to CoolestSG Consortium members, its invited guests and government agencies. A Zoom link will be sent to registered attendees no later than two days from the event. For registration click **here** or scan the below QR Code no later than two days from the event.

The Phase-Change Material thermal energy storage system co-developed by NUS has been installed at Keppel DHCS' Changi Business Park District Cooling System Plant.
Photo credit: Keppel DHCS

Event Organizer: Cooling Energy Science and Technology Singapore - CoolestSG Consortium

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INTRODUCTION

The global demand for space cooling has tripled since 1990, and is forecast to triple again in the next 30 years and consume 6,250 TWh of electricity per year in 2050. The Asia-Pacific is forecast to account for more than half of that demand with India accounting for 22%, China 15% and Indonesia 5%. A warmer climate, higher affordability, urban heating island effect are examples of drivers for the increased demand for cooling. United Nation's 7th Sustainable Development Goal (SDG) calls for a reduction in energy spent on cooling and more energy efficient and clean cooling. On the other hand other SDGs require more cooling. Here, refrigeration plays an important role, including in the domestic, commercial, industrial and transport sectors.

The increased demand for cooling demand has a considerable environmental impact. The global cooling-induced environmental impact in terms of Green House Gas (GHG) emissions are both "indirect" from energy use (65%) and "direct" from refrigerants (35%) and reached 3.95 GtCO2eq in 2022. The above-mentioned drivers and environmental impact derived from increased cooling demand, in combination with the urbanization and electrification trends, provide more opportunities for the development of more energy efficient and sustainable District Cooling technologies, which not only can make District Cooling even more sustainable, energy efficient and cost-effective, but can also unlock the potential of integrating district cooling systems to other energy systems in the community, which ultimately can help to decarbonize cooling and decouple cooling from the emissions of GHGs.

The Asia-Pacific region is diverse, both in terms of climate, economic development, business climate, as well as policies and regulatory frameworks. In order to develop District Cooling Systems, it is important to understand and adapt to local conditions. In this webinar, Mr Mikael Jakobsson from Asia-Pacific Urban Energy Association (APUEA) will provide an overview of the District Cooling developments in the Asia- Pacific region. That will be followed by a panel discussion on challenges and opportunities for research in district cooling which will be followed by a Q&A session where CoolestSG members and stakeholders can contribute to the discussion.

PROGRAM OUTLINE

14:55 Admittance of attendees to the event

15:00 Welcome remarks and introduction

15:05 Opening remarks - Dr David Broadstock
NUS Energy Studies Institute

15:15 District Cooling Systems in the Asia-Pacific -
Mikael Jakobsson, President, APUEA

15:45 Challenges and Opportunities for Research in District Cooling
Panel Discussion:
- **Mr Mikael Jakobsson. President, APUEA**
- **Mr Dimitris Karamitsos, Senior Business Developer Specialist, Energy Efficiency, BASE**
- **Dr Binod Koirala, Deputy Group Leader, Urban Energy System Lab**
- **Dr Victor Nian, CEO, CSER**

16:30 Questions & Answers

16:55 Closing remarks

ABOUT THE COOLESTSG CONSORTIUM

CoolestSG is a national consortium set up by NRF in 2018. The task of the CoolestSG Consortium is to bring stakeholders together to catalyse co-development between researchers and industry of novel low-energy cooling technologies and/or passive/integrated designs and to translate research into deployment and commercialisation with the aim to promote Singapore as a frontrunner in cooling technologies.

Screenshots may be taken during this webinar which will be recorded.

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ABOUT THE SPEAKERS AND PANEL PARTICIPANTS

Mr. Mikael Jakobsson is the President of the Asia Pacific Urban Energy Association (APUEA), and CEO of the District Energy consulting firm NXITY. Mr. Jakobsson is a graduate civil engineer with a masters' degree in HVAC/Energy from the Royal Institute of Technology, Sweden. Mr. Jakobsson has 20 years of experience within Energy Management and Energy Engineering, with specialist knowledge in planning of smart RE-integrated Urban Energy systems and hydraulic steady-state and transient-state analysis of complex district energy systems. In the past 15 years, Mr. Jakobsson has developed and executed some 70 Urban Energy projects across Asia-Pacific. Mr. Jakobsson started his career working as analyst for the Finnish state-owned energy enterprise Fortum, optimizing the District Energy systems in Stockholm, Sweden.

Mr Mikael Jakobsson, Executive Director, APUEA, CEO, NXITY

In 2017, Mr. Jakobsson initiated the establishment of Asia Pacific Urban Energy Association (APUEA) as a response to requests from various stakeholders across the Asia-Pacific region. APUEA is a not-for-profit regional membership-based sector association promoting the development of sustainable urban energy systems, including District Cooling. APUEA provides a platform for cross sectoral collaboration, supporting cities and bridging the public and private sectors. APUEA works with both the public and private sectors across the region, empowering cities and increasing public awareness on district cooling and its benefits. Furthermore, APUEA provides an arena for marketing, project development and collaboration for and between its members.

Mr Dimitris Karamitsos is a Senior Energy Efficiency Business Developer Specialist at the Basel Agency for Sustainable Energy (BASE). He has 12+years of experience in the energy sector, technology and entrepreneurship in Europe, Africa, Asia, and Latin America. He is an engineer and business developer with a focus on Sustainability. Dimitris has been co-leading the BASE Cooling as a Service and Efficiency as a Service initiatives, which aim to unlock investments in clean and efficient solutions through the disrupting servitisation business model.

Mr Dimitris Karamitsos Senior Energy Efficiency Business Developer Specialist, BASE

Established in 2001, BASE is a Swiss foundation and Specialized Partner of United Nations developing innovative, actionable financial strategies and market-driven solutions to unlock investment in climate change solutions using their expertise in technology, markets, economics, finance and business development.

Dr. Binod Koirala is a deputy group leader of multi-energy systems and cluster leader of energy system design at Urban Energy System Lab, Empa, Switzerland. He holds a Ph.D. in Sustainable Energy Technologies and Strategies from TU Delft, KTH and Comillas. He is an electrical engineer and renewable energy specialist with more than 15 years of international experience in both developed and developing countries. Dr. Koirala has in-depth knowledge of integrated community-based energy systems, multi-energy systems, distributed energy resources including PV, heat pumps, fuel cells, and energy storage, power systems, energy markets, energy policy as well as technical, economic, environmental and institutional issues in the energy system transformation. He is a task leader in local energy planning for future thermal grids for the ongoing SWEET Decarbonization of heating and cooling in Switzerland (DecarbCH) project.

Dr Binod Koirala, Deputy Group Leader, Urban Energy System Lab, UESL

Urban Energy System Lab (UESL) conducts cutting-edge research to develop decentralized energy solutions that significantly contribute to reaching national and global emission targets. It focuses on the development of methods, strategies and solutions to transform buildings, neighborhoods, districts and cities into energy-efficient and decarbonized systems. UESL's core competencies lie in the modeling, simulation, optimization as well as design and assessment of buildings and urban systems with the focus on energy hubs, multi-vector energy grids as well as integration of distributed energy resources including renewables and storage systems.

Dr Victor Nian is CEO of Centre for Strategic Energy and Resources (CSER). He holds a PhD in Mechanical Engineering and a Bachelor in Electrical Engineering with a Minor in Management of Technology, all from NUS. His research portfolio covers a wide spectrum of energy issues with focus on long-term planning, technology assessment, and climate and industrial policies. In the spirit of "research & innovation without borders", he established and served as the Executive Director of UNiLAB on Integrated Systems Analysis Tools which hosts a global network of experts and research organisations. He is co-leading the regional CO2 storage options study with focus on policy, regulation and legislation. He was previously a Visiting Fellow at the Hughes Hall, University of Cambridge.

Dr Victor Nian, CEO, Centre for Strategic Energy Resources, CSER

CSER is an independent Think-and-Do Tank focusing on strategic issues in energy, resource, and sustainable development set up earlier this year. The mission is to provide analysis of strategic options in energy and sustainable development to inform policy makers, develop innovative solutions in response to the evolving global energy landscape and to promote discussion and advance collective understanding on strategic issues related to energy and sustainable development.

RIGHT: Various types of energy systems in the community. Community energy systems are becoming more popular and efficient than conventional energy systems. This is because they are decentralized, modular, and more flexible than the traditional energy systems. Furthermore, these systems are usually located near the communities they serve to avoid long transmission of energy. On the other hand, these systems are limited in their capacity.
Source: Science Direct, Community Energy Systems, I Dincer, A Abu-Rayash