

Anonymous Attendee 10:13 AM

As heat pumps and waste heat recovery were topics people are most interested in, I would suggest having Dr. Srinivas Garimella as a speaker/panelist.

Mark Roest 10:19 AM

Please include passive solar design, based on traditional climate adaptation, which minimizes the need for mechanical HVAC.

Michael Deru 10:26 AM

Thank you for these questions. However, they are over simplified and do not fully capture the issues. Question 1. Optimal performance depends on mix and timing of energy sources and interactions with other buildings on the local grid. It also depends on the performance metrics (total energy, fossil energy, carbon, ...) For example, it may be beneficial to use more energy if there is abundance of locally sourced renewable energy when it is available to precool the building, charge a thermal energy storage system, or regenerate a desiccant.

Michael Deru 10:28 AM

Question 2. Energy savings from intelligent controls depend on the efficiency of the existing systems and on the controls that are used for the baseline. It is difficult to achieve high energy savings with standard efficiency equipment using reasonable controls.

Amir Roth 10:31 AM

What about ventilation? FCUs and mini-splits do not provide fresh air.

T.S. Zhao 10:34 AM

Was the comparison in energy consumption between centralized and decentralized made for the same building?

Michael Wetter 10:35 AM

Your argument against district cooling used a 2nd generation district cooling.

In view of the shift towards increased integration of large renewables, storage and all electric heating, what is your position towards decentralized systems vs the 5th generation district heating and cooling systems, which support such a shift while allowing fully decentralized control and COPs above 6?

Anonymous Attendee 10:38 AM

if we can provide cooling powers only to the occupied areas on demand, and control the overall cooling powers accordingly, would the centralized be better than the decentralized?

Amir Roth 10:48 AM

What is your preferred solution for outdoor air? Centralized? Decentralized? Commercial buildings have a lot of core interior space, effectively forcing centralized OA approaches. Even for perimeter spaces, OA solutions are going to compromise envelope thermal performance and "look".

Anonymous Attendee 10:48 AM

Is it beneficial and realistic to apply the cooling strategy in Singapore and Hong Kong (where the indoor AC temperature is kept at its lower bound and does not offer much upwards adjustability for energy saving) universally in other countries and regions like China and the US?

Leon R Glicksman 11:03 AM

what about the use of natural ventilation to reduce AC use?

jorge.alvarado 11:03 AM

Have ASHRAE and IIR (industry groups) been supportive of your assessment and main conclusions?

Anonymous Attendee 11:07 AM

Is 'storage system' for cooled media e.g chilled water or air a relevant research direction to address the issues with oversupply, like the case with electricity & battery?

Leon R Glicksman 11:09 AM

users of decentralized units can be billed for their individual use whereas centralized system use is uniformly billed whatever the individual use. How does this influence the users?

Qianying 11:09 AM

We are seeing lots of centralized district cooling systems being built, e.g on Stanford campus. Last summer we encountered chilled water shortage on the hottest days. Do you think this is also a disadvantage of centralized systems in general, or just a load estimation issue?

Anonymous Attendee 11:13 AM

What role, if any, do you see adsorption-based cooling systems playing a role in air conditioning in the future? Are they more advantageous for centralized or decentralized systems?

Saeed Moghaddam 11:14 AM

What are your latest practical results on separate sensible and latent cooling (SSLC)?

Hilary Anna Johnson 11:24 AM

I've found that the available data is limited for learning models and data analysis working on pump efficiency for water treatment systems. Drawing an analogy to HVAC systems, what sensors do we need to include in new systems to enable control and intelligence?

Krish Gomatom 11:24 AM

The demand and satisfaction formulation shown is somewhat addressed in newer VRF systems. But these systems are not widely installed because of cost, footprint etc. Are you suggesting taking the older, centralized, legacy systems installed in the US today and somehow adding retrofit hardware to optimize the efficiency and demand satisfaction?

Aditya Narain 11:30 AM

what do you think about radiant cooling in country like India.