



# POORNIMA

## COLLEGE OF ENGINEERING

Promoted by Shanti Education Society, Affiliated to Rajasthan Technical University & Approved by AICTE

### **A REPORT ON WEBINAR**

**TITLE AND DURATION:** An International Webinar on “Ventilation, IAQ and Energy Issues in Hot-Humid Climates – Past, Present and Future” June 16, 2020

**SPONSORS & SUPPORTERS:** ASHRAE Rajasthan Chapter (**Under MoU with Kamal Cogent Energy, Jaipur**)

**ORGANIZER(S):** Department of Mechanical Engg, Poornima College of Engineering, Jaipur.

#### **EXPECTED OUTCOMES:**

- Student will be able to enhance the knowledge of Refrigeration and Energy Industry.
- Student will be able to recognize the different scopes of Mechanical Engg in Energy field.
- Student will be able to analyze their future perspective in the field of Energy Issues.

#### **MAPPINGS WITH PO & PSO:**

| CO  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO1 | -   | -   | -   | -   | -   | 3   | -   | -   | -   | -    | -    | -    | 2    | 3    | 2    |
| CO2 | -   | -   | -   | -   | -   | -   | -   | -   | 3   | -    | -    | -    | 2    | 3    | 2    |
| CO3 | -   | -   | -   | -   | -   | -   | -   | -   | -   | -    | -    | 3    | 2    | 3    | 2    |

## FLYER / POSTER :

The flyer features the logos of Poornima College of Engineering and ASHRAE Rajasthan Chapter. It includes a portrait of Dr. Chandra Sekhar, a professor from the National University of Singapore. The title of the webinar is "A Webinar on Ventilation, IAQ and Energy Issues in Hot-Humid Climates – Past, Present and Future". The event is organized by the Department of Mechanical Engineering and takes place on Tuesday, June 16, 2020, from 11:00 AM to 12:00 PM through GoToWebinar.

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**ASHRAE® Rajasthan Chapter**

**A Webinar on**  
**Ventilation, IAQ and Energy Issues**  
**in Hot-Humid Climates – Past,**  
**Present and Future**

**Organized by**  
**Department of Mechanical Engineering**

**TUESDAY, JUNE 16, 2020**

**TIME 11:00 AM - 12:00 PM**

Session Through : GoToWebinar

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**Dr. Chandra Sekhar**  
Prof, Department of Building,  
School of Design and Environment,  
National University of Singapore

## BRIEF BIODATA OF RESOURCE PERSON:

### Chandra Sekhar, Ph.D.

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Dr. Chandra Sekhar is currently a Professor and Programme Director (M.Sc – Building Performance and Sustainability) and Co-Director (Centre for Integrated Building Energy and Sustainability in the Tropics) in the Department of Building at the National University of Singapore (NUS). He is also a Founding Director of Enhanced Air Quality Pte Ltd., a NUS Spin-off Company incorporated in June 2004, arising out of his research in the fields of indoor air quality (IAQ) and Energy. He has been an IAQ consultant in Singapore since 1993. He holds BE (Mechanical Engineering) from the University of Rajasthan (Malaviya National Institute of Technology), India and PhD (Mechanical Engineering) from the University of Adelaide, Australia, in the area of energy efficient cooling and dehumidification systems. In 1992, he joined NUS as a

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faculty and has since been teaching and conducting research in the areas of thermal comfort, ventilation and indoor air quality, energy efficient HVAC systems, building energy analysis/management and integrated building design/operation and has published about 250 papers in these areas in several international journals and conferences.

Prof. Sekhar is an Associate Editor of ASHRAE Science and Technology for the Built Environment (STBE) [formerly HVAC&R Research] journal, Regional Editor (South East Asia) Indoor and Built Environment and an editorial board member of Energy and Buildings, Building and Environment, International Journal of Ventilation and International Journal of Sustainable Built Environment. He is a regular reviewer of articles for several international journals, such as, ASHRAE STBE and Transactions; Indoor Air; Energy and Buildings; Building and Environment; Energy; International Journal of Ventilation & Indoor and Built Environment. He is a co-inventor and holds 3 US and other patents in the area of energy efficient air-conditioning system with zonal ventilation control for enhanced indoor air quality. He is a member of the International Scientific Committee of the Healthy Buildings, Indoor Air, ROOMVENT, CLIMA and IAQVEC series of conferences. He was the Chair of the Steering Committee for ASHRAE IAQ2010 conference in Kuala Lumpur in 2010 and continues to be on the steering committee of subsequent ASHRAE IAQ conferences (Vancouver, 2013 and Alexandria, USA, 2016).

Prof Sekhar is a Fellow of ASHRAE and the International Society for Indoor Air Quality and Climate (ISIAQ). He is a co-recipient of The Enterprise Challenge award of the Prime Minister's Office, Singapore in 2004 and ASEAN Energy Award in 2011. He is also a member of the Institution of Engineers, Australia (CPEng, IEAust). He is a past Chair of the Environmental Health Committee (EHC, 2012-2013) and was a member of the IEQ-Global Alliance Ad Hoc Committee (2013-2017), EHC (2006-2012 & 2016-2018). He has also served the ASHRAE Singapore Chapter in various capacities, including as its President during 2010-2011 and as a BOG member.

#### **ABSTRACT OF THE SESSION:**

"Ventilation, IAQ and Energy Issues in Hot-Humid Climates – Past, Present and Future".

This talk will provide an overview of the ventilation, IAQ and energy issues in commercial office buildings in hot humid climates. It presents the design challenges based on climatic differences with due consideration given to local codes and ASHRAE Standards 55, 62.1 and 90.1. Typical HVAC design for different building types in hot humid climates will be covered with emphasis on both design and part load characteristics. The role and importance of cooling and dehumidifying coil and limitations in conventional designs will be highlighted. Effective and practical zone level ventilation control will be introduced and the notion of energy efficient healthy environment.

  
**Dr. Mahesh Bunde**  
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presented.

Department of Mechanical Engineering, PCE organized an International webinar presentation on topic “Ventilation, IAQ and Energy Issues in Hot-Humid Climates – Past, Present and Future” on June 16, 2020, at 11:00 AM in association with ASHRAE Rajasthan Chapter. It was delivered by Dr. Chandra Sekhar. He is currently a Professor and Programme Director (M.Sc – Building Performance and Sustainability) and Co-Director (Centre for Integrated Building Energy and Sustainability in the Tropics) in the Department of Building at the National University of Singapore (NUS)

Mr. Shailendra Kasera welcomed the guest and all the participants. He introduced the guest and spoke about the webinar. Thereafter, Dr. Chandra Sekhar explained that, Why are air-conditioned buildings in hot and humid climates so cold that one gets reminded of carrying a jacket when going to office? Would raising the set point temperatures in these buildings do the trick? What are the engineering challenges that necessitate a relook at the way air-conditioned buildings in such climates are designed? This talk will review some of the fundamental issues of cooling and dehumidification facing the HVAC designer and the inevitable and inherent design of an oversized system and its undesirable consequences in terms of an overcooled indoor environment. It will provide an understanding of the psychometric challenges involved in cooling and dehumidification at peak and part loads in hot and humid climates. Possible solutions to creating a more thermally comfortable and healthy indoor environment that can also save energy will be discussed.

This talk covered the key features of a comprehensive indoor air quality (IAQ) and energy study conducted in commercial office buildings in a hot humid climate in the mid-to-late nineties and will compare the findings with similar large-scale studies conducted in Europe and USA. An integrated IAQ and energy audit methodology was adopted and the key performance parameters measured include various indoor pollutant concentration levels, ventilation characteristics (such as outdoor air change rate, ventilation efficiency and air exchange effectiveness), energy index and subjective responses (Building Symptom Index, Thermal comfort acceptability, IAQ acceptability).

The session ended with the vote of thanks by Dr Narayan Lal Jain, Professor & Head, Department of Mechanical Engineering, PCE. 287 participants benefited by the expertise of Dr. Chandra Sekhar.



## GLIMPSES:

The screenshot shows a GoToWebinar control panel on the right side of the screen. The main content area displays a presentation slide with the following text:

**ASHRAE DL Webinar**  
ASHRAE Rajasthan Chapter  
Jaipur  
16 June 2020

**Ventilation, IAQ and Energy issues in hot humid climates – Past, Present and Future**

Professor Chandra Sekhar, PhD  
Fellow ASHRAE, ISIAQ  
Department of Building,  
School of Design and Environment  
National University of Singapore, Singapore

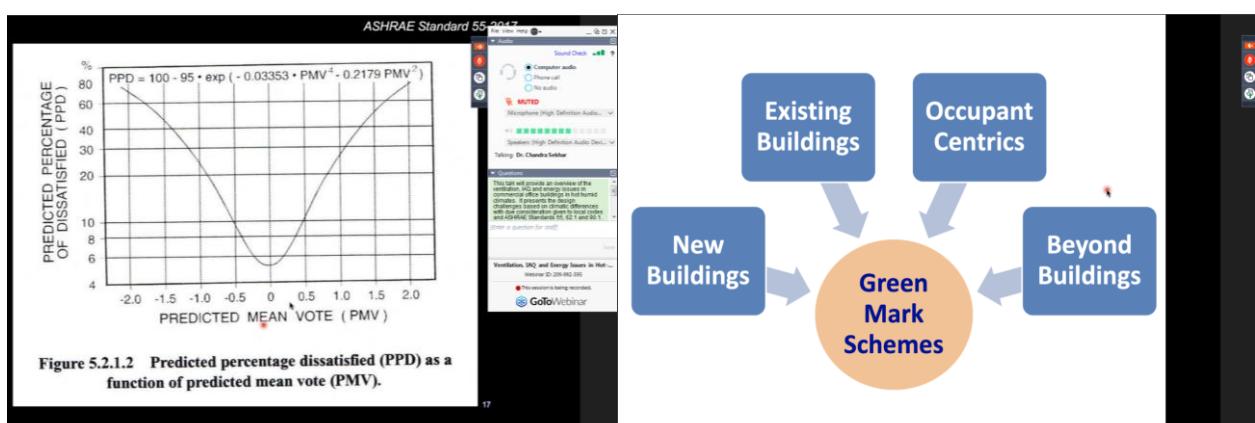
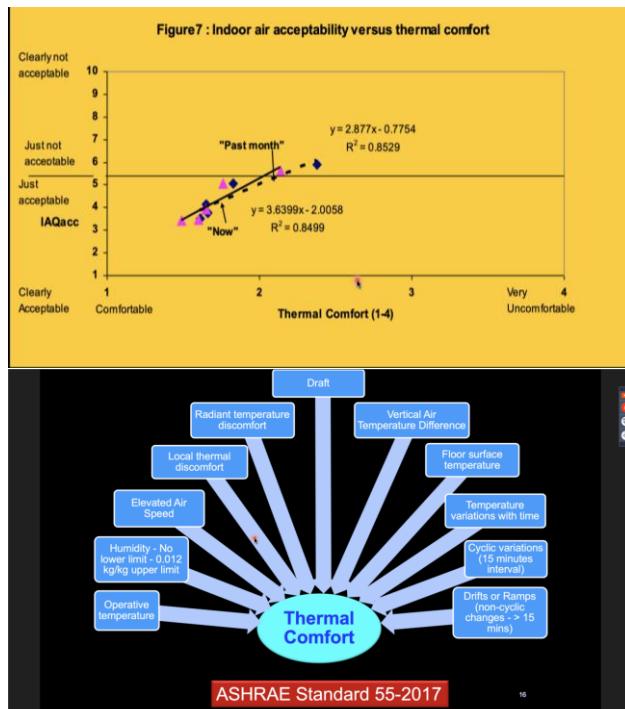
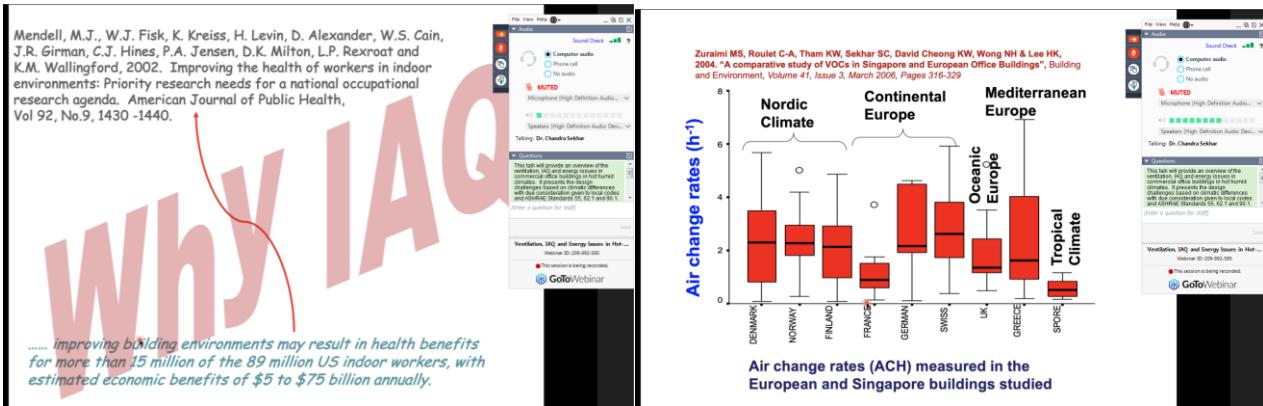
The GoToWebinar interface includes sections for audio settings (Computer audio selected), sound check, muted status, speakers, talking, questions, and a GoToWebinar logo.

The screenshot shows a GoToWebinar control panel on the right side of the screen. The main content area displays a presentation slide with the following text:

**Learning Objectives**

- 1. Understand the importance of an integrated IAQ-Energy concept**
- 2. Understand the impact of ventilation and IAQ on occupant productivity and health**
- 3. Describe the key features of Thermal Comfort and Ventilation Standards (a) ASHRAE Standards 55 & 62.1 and (b) Singapore Standards**
- 4. Describe the Singapore Green Mark Scheme for rating buildings for environmental sustainability**
- 5. Understand the notion of Smart, Sustainable and Healthy Built Environments**

The GoToWebinar interface includes sections for audio settings (Computer audio selected), sound check, muted status, speakers, talking, questions, and a recording indicator. A message at the bottom states "This session is being recorded."



**BCA Green Mark Award Rating Scores**

| Green Mark Rating               | Green Mark Score |
|---------------------------------|------------------|
| Green Mark Platinum             | 70 and above     |
| Green Mark Gold <sup>PLUS</sup> | 60 to < 70       |
| Green Mark Gold                 | > 50 to < 60     |

[https://www.bca.gov.sg/GreenMark/others/Green\\_Mark\\_NRB\\_2015\\_Criteria.pdf](https://www.bca.gov.sg/GreenMark/others/Green_Mark_NRB_2015_Criteria.pdf)

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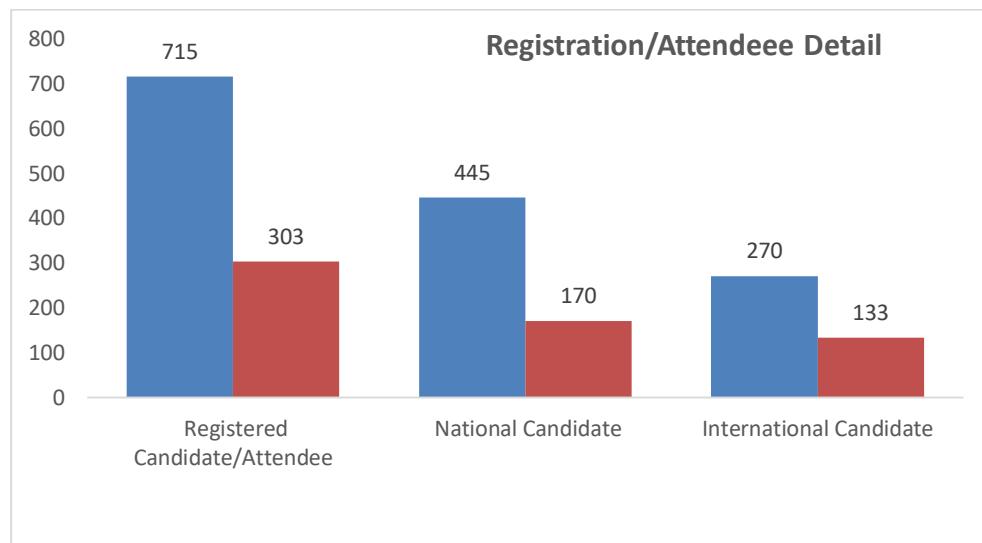
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| 39 | 2016pcemevikas117@poornima.org           | Kumar Vikas          | Yes     | Yes | 4 |
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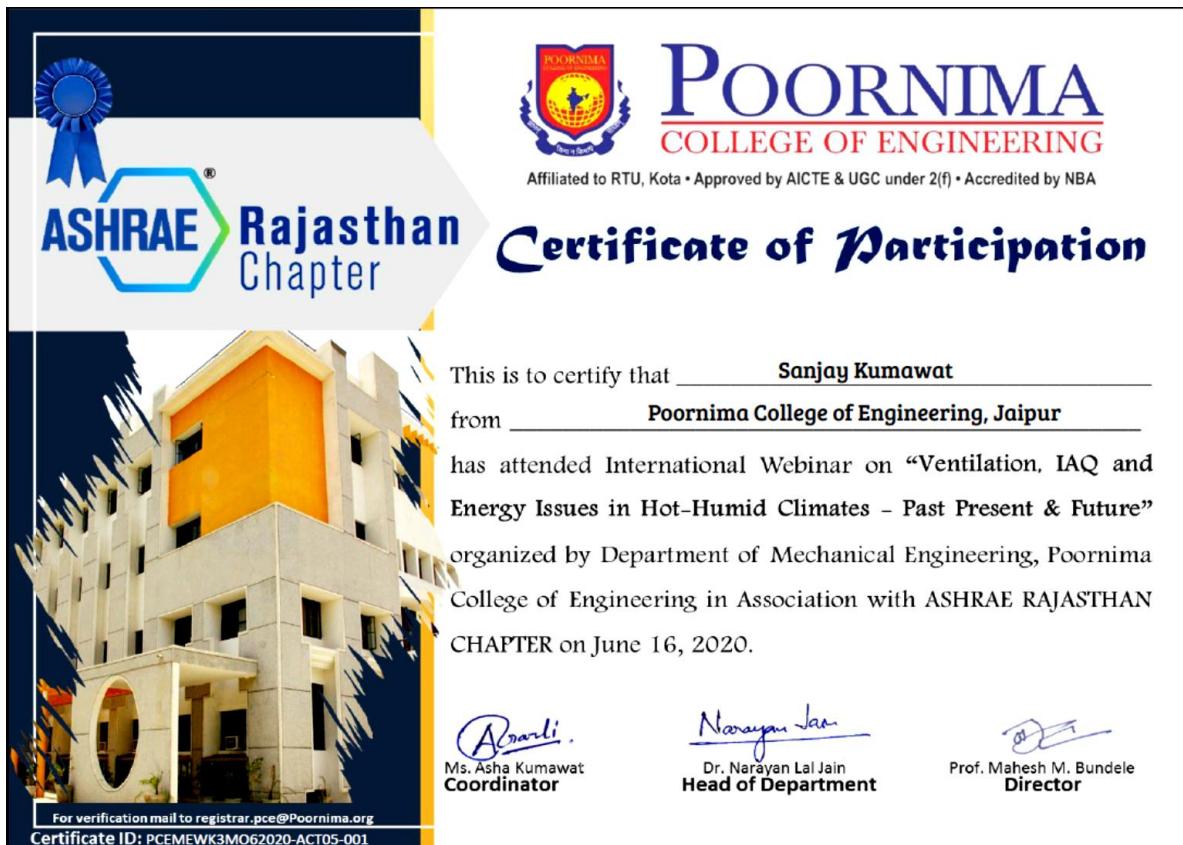
|     |                                     |                           |        |     |   |
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## FEEDBACK ANALYSIS:

| Sr.no. | Attributes   | Total Feed Back | Total Feed Back- 280<br>>80% Objective Achieved, 60 to 79 %- Satisfactory, Below 60%, Need improvement |       |       |       |       |  |
|--------|--|-----------------|--|-------|-------|-------|-------|--|
|        |  |                 | Yes  | No    | Maybe | ---   | ---   | Remark   |
| 1      | Do you think webinar was useful for you?                         | 138             | 135  | 1     | 2     | ---   | ---   | Objective Achieved (97.83%)                            |
|        |  |                 | 97.83  | 0.72  | 1.45  | ---   | ---   |  |
|        |  |                 | 128  | 19    | ---   | ---   | ---   |  |
| 2      | Did you receive all the information you expected at the webinar? | 138             | 92.75  | 13.77 | ---   | ---   | ---   | Objective Achieved (92.75%)                            |
|        |  |                 | 1  | 2     | 3     | 4     | 5     |  |
|        |  |                 | 0  | 1     | 10    | 55    | 72    |  |
| 3      | How would you rate the webinar?                                  | 138             | 0.00   | 0.72  | 7.25  | 39.86 | 52.17 | Rating 4 & 5 Combindly Achieved the objective (92.03%) |

CERTIFICATE:



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