

# Workshop on Enhancing Energy Efficiency in Operations of HVAC Systems

December 10, 2021

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*If you want to control performance, measure forever*

## Program Overview

In commercial buildings, HVAC consumes more than 50% of the overall energy consumption. HVAC system work on varying loads and performance drifts do occur leading to a lot of inefficiency. Many of the issues of HVAC system performance are common across applications & this Workshop will focus on explaining the fundamentals of operations of central chilled water plants. The objective of the Workshop will be to cover the fundamentals of HVAC systems in a very lucid manner & to provide tips on improving equipment as well as system level efficiency.

The program is basically designed for HVAC Operations Team to help them get a very clear understanding of HVAC processes and equipment functioning. The Workshop shall be conducted in an interactive manner and aims to dispel common myths as well as provide tips on energy optimization. It is our endeavour to empower participants to implement various low cost/no cost ECMs for HVAC systems that improve efficiency by 10-15%.

## Target Audience

- ▶ Facility Management Engineering Team
- ▶ Facility Managers and HVAC Engineers
- ▶ Energy Auditors
- ▶ ESCOs who conduct energy audits and implement retrofits

## Training Agenda

The training will cover following topics:

### Module 1: Overview of HVAC Systems

- Dissecting the various loops in HVAC
- Components in each sub-system / loop
- Interaction of loops with each other
- Overall plant efficiency

### Module 2: Efficiency of HVAC Systems

- Operating decisions affecting achieved plant room efficiency
- Performance Degradation & Performance Drift
- Defining an optimized plant room performance

### Module 3: Ways to improve Chiller Efficiency

- Maximizing chiller operating efficiency
- Savings opportunities related to component, system & retrofit

### Module 4: Basics of Pump Selection

- Pump Curves
- Pump Energy Calculations
- Pump Operating Point

### Module 5: Chilled Water Pumping Configurations

- Constant Primary, Primary-Secondary & Variable Primary
- Control Philosophy

### Module 6: Cooling Tower Fundamentals

- How a Cooling Tower works
- Cooling Tower performance characteristics
- Installation & Operation of Cooling Towers

### Module 7: Energy Management and M&V

- Need for M&V to sustain performance
- Monitoring & Optimization
- Example of Chiller Plant efficiency monitoring

## About AEEE

Alliance for an Energy Efficient Economy (AEEE), is one of the leading organizations in India that works on creating awareness about energy efficiency as a resource. It is a policy advocacy and energy efficiency market enabler with a not-for-profit motive. We advocate for data-driven and evidence-based energy efficiency policies and research.

We foster a culture of energy efficiency in India, working with industry, government and civil society organizations. AEEE advocates for *Thermal Comfort for All*, and a *Lean-Mean-Green* philosophy to design and construct net-zero energy-water-waste built environments, Sustainable Transportation and robust Energy Data Framework for better policy-making and implementation, to build a culture of energy efficiency in India. We are committed to achieve India's energy transition for a climate-resilient and energy secure future and meet India's commitments to the 2030 Nationally Determined Contributions (NDC) and UN Sustainable Development Goals (SDG).

## Testimonials from Previous Workshops



Technical materials on operation and maintenance of HVAC systems were very well presented by Mr. Sandeep Dahiya. Concepts and practical tips learned in workshop can be immediately applied and put into practice which I am sure will lead to significant energy and cost savings.

**Mr. K. Kamakshaiah,**  
Sr. Engineer (Maintenance), Quality Care Hospitals



Very good workshop, very well presented and nicely managed workshop. I learned a lot on chilled water pumping configuration systems.

**A. K. Kaushal,**  
Chief Engineer, Rajiv Gandhi Cancer Institute & Research Centre, Delhi



The trainer was fully loaded with all useful relevant information excellent and explained things in a very detailed manner.

**R. N. Pandya,**  
Retd. Senior Project Executive, GEDA, Gujrat



## About the Trainer

Sandeep Dahiya has over 20 years' experience in HVAC industry, having worked in sales, service and product management roles. Since 2014, he has been working as a Freelance Energy Engineer helping Building Clients run their HVAC systems more efficiently thru' Retro-commissioning, Retrofits and Energy Management. He is a BEE Certified Energy Auditor, LEED AP, CMVP & BCXP. He is also a certified Level 4 Trainer for CMVP & has conducted numerous workshops in India & abroad.



### Registration

Last Date of registration:  
**December 5, 2021**

Registration Fee:  
**₹ 10,000 + GST**

**10% OFF** for AEEE member companies)

For Registration form & more detail, visit: [www.aeee.in](http://www.aeee.in)



### For any Queries, write to:

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### Useful Links

ECBC User guide:

<https://beeindia.gov.in/sites/default/files/ECBC%20User%20Guide%20V-0.2%20%28Public%29.pdf>

ICAP report:

<http://ozonecell.nic.in/wp-content/uploads/2019/03/INDIA-COOLING-ACTION-PLAN-e-circulation-version080319.pdf>