



*wel come to*  
**BEYOND SMART CITIES**

**BEYOND**  
SMART CITIES



# HIGH-PERFORMANCE BUILDING DESIGN PROFESSIONAL - HBDP EXAM REFRESHER

ONLINE PROFESSIONAL COURSES LED BY THE  
WORLD'S TOP SPECIALISTS

ONLINE TRAINING BY KRISHNAJI PAWAR

LEED AP(BD+C), GSAS CGP, GCP, ISO 14001

[LEARN.BEYONDSMARTCITIES.IN](http://LEARN.BEYONDSMARTCITIES.IN)

**BEYOND**  
SMART CITIES

MODULE  
**19B**

# Benchmarking with Performance Metrics

KRISHNAJI PAWAR - CEO & FOUNDER

LEED AP(BD+C),GSAS CGP,GCP,ISO 14001

[WWW.BEYONDSMARTCITIES.IN](http://WWW.BEYONDSMARTCITIES.IN)



# **HIGH-PERFORMANCE BUILDING DESIGN PROFESSIONAL - HBDDP EXAM REFRESHER**

Benchmarking is a systematic process used to measure and compare an organization's performance against established standards or best practices within the industry. It serves as a tool for organizations to identify areas for improvement, enhance efficiency, and achieve strategic goals.



**ENERGY PERFORMANCE  
VERIFICATION**

# Learning Objectives +

- **Benchmarking with Performance Metrics**
- **Water Conservation**
- **Commissioning in Sustainable Construction**
- **Energy and Materials Use and Management**
- **Summary and Resources**
- **HBDP Practice Test V.4.1\_Test Your Knowledge!**



## ENERGY PERFORMANCE VERIFICATION OVERVIEW

- A systematic process that confirms a building's operation according to its intended energy performance specifications.
- Crucial for energy management, sustainability practices, and regulatory compliance.
- Involves assessing energy use, identifying variances, and implementing corrective actions to optimize energy efficiency.
- Crucial in compliance, cost savings, sustainability, and performance optimization.
- Components include baseline establishment, performance monitoring, data analysis, verification process, and reporting and documentation.
- Baseline establishment involves collecting historical energy consumption data and operational parameters.
- Performance monitoring involves continuous assessment of energy use and operational parameters.
- Data analysis compares current energy consumption against the established baseline and identifies discrepancies.
- Verification process validates data accuracy and reliability.
- Results must be documented and reported to stakeholders for accountability and compliance.

# ENERGY PERFORMANCE VERIFICATION IN BUILDING PERFORMANCE ASSESSMENT

## Understanding Energy Performance Verification

- Refers to the systematic assessment of a building's energy use against established benchmarks or standards.
- Evaluates how well a building's design and operational practices align with energy efficiency goals.

## Key Concepts and Terminology

- Energy Use Intensity (EUI): Defined as the total energy consumed by a building per unit area per year.
- Baseline Model: Established based on standard energy consumption values for similar building types and uses.
- Simulation Tools: Software tools like EnergyPlus and eQUEST used to simulate building energy performance.
- Post-Occupancy Evaluation (POE): Assesses the energy performance of a building after it has been occupied.



# ENERGY PERFORMANCE VERIFICATION IN BUILDING PERFORMANCE ASSESSMENT +

## Methodologies for Performance Measurement

- Data Collection: Initial step in energy performance verification involves collecting data on energy consumption.
- Comparative Analysis: Conducts a comparative analysis against the baseline model.
- Energy Audits: Conducts quick assessments that identify glaring issues.
- Benchmarking: Compares the building's energy performance against similar buildings or industry standards.



# NORMALIZATION OF ENERGY PERFORMANCE VERIFICATION DATA AND TRENDS

## Understanding Normalization

- Normalization is the process of adjusting data to account for variables that could skew results.
- It is crucial in energy management and performance verification due to factors influencing energy consumption.

## Methods of Normalization

- Weather Normalization: Adjusts energy consumption data to account for variations in weather conditions.
- Occupancy Normalization: Adjusts energy data based on the number of occupants or usage intensity in a building.
- Time-Based Normalization: Adjusts data for different operational hours or seasonal variations.





# NORMALIZATION OF ENERGY PERFORMANCE VERIFICATION DATA AND TRENDS +

## Analyzing Trends Post- Normalization

- Identifying Efficiency Improvements: Normalized data can reveal the effectiveness of energy efficiency measures implemented within a facility.
- Benchmarking: Provides a reliable basis for benchmarking against industry standards or peer facilities.



# COMPARING BUILDING PERFORMANCE: PROJECTIONS AND SIMILAR BUILDINGS

## A. Comparison Against Projections

- Performance projections emerge from the design phase of a building project.
- The importance of comparing actual performance against these projections lies in validating design assumptions, identifying discrepancies, and enhancing future design practices.
- The method involves establishing clear metrics projected during the design phase.
- When discrepancies are identified, stakeholders should investigate the underlying causes, such as reviewing operational practices, tenant behavior, and evaluating maintenance practices.
- The process can be likened to a medical diagnosis, comparing a patient's symptoms against expected health indicators.
- The insights gathered from these comparisons assist in optimizing the existing building's performance and serve as valuable feedback for future design projects.



# COMPARING BUILDING PERFORMANCE: PROJECTIONS AND SIMILAR BUILDINGS +

## B. Comparison Against Similar Buildings

- The method provides a contextual understanding of a building's operational efficiency.
- The benchmarking process involves gathering performance data from a set of comparable buildings.
- The benchmarking process can highlight underperformance and identify best practices from high-performing buildings.
- Building managers can analyze peer performance to refine operational practices and improve efficiency.
- Benchmarking results can help set realistic performance targets for ongoing operations.

## Conclusion

- Comparative analysis of building performance against projections and similar buildings is instrumental in the pursuit of efficiency and sustainability in the built environment.





# CONTACT US



+91 6363032722



[info@beyondsmartcities.in](mailto:info@beyondsmartcities.in)



[learn.beyondsmartcities.in](http://learn.beyondsmartcities.in)



#55,HMR Layout ,Bengaluru ,India



# THANK YOU

