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# APPLICATIONS OF ENERGY MODELS FOR BUILDINGS

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**ONLINE TRAINING BY KRISHNAJI PAWAR**

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

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MODULE  
**L14**

# Case Study: Application of BEM

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# APPLICATIONS OF ENERGY MODELS FOR BUILDINGS

Key concepts of BEM include the thermal envelope, energy loads, and simulation algorithms. Understanding these concepts is essential for interpreting results and transitioning between different software packages. Case studies, such as net-zero energy buildings and retrofitting existing buildings, illustrate the application of BEM concepts in real-world scenarios.

# Learning Objectives

- Introduction and Course Outline
- Simulation Comparisons
- Modeling Energy Performance
- Evolution of Simulation Techniques
- Baseline Building Models
- Communicate Analysis Results
- Collaborate Within Project Teams
- Applications of Energy Models for Building
- **Case Study: Application of BEM**
- Summary and Resources
- BEMP Practice Test V.5.1



## INTRODUCTION

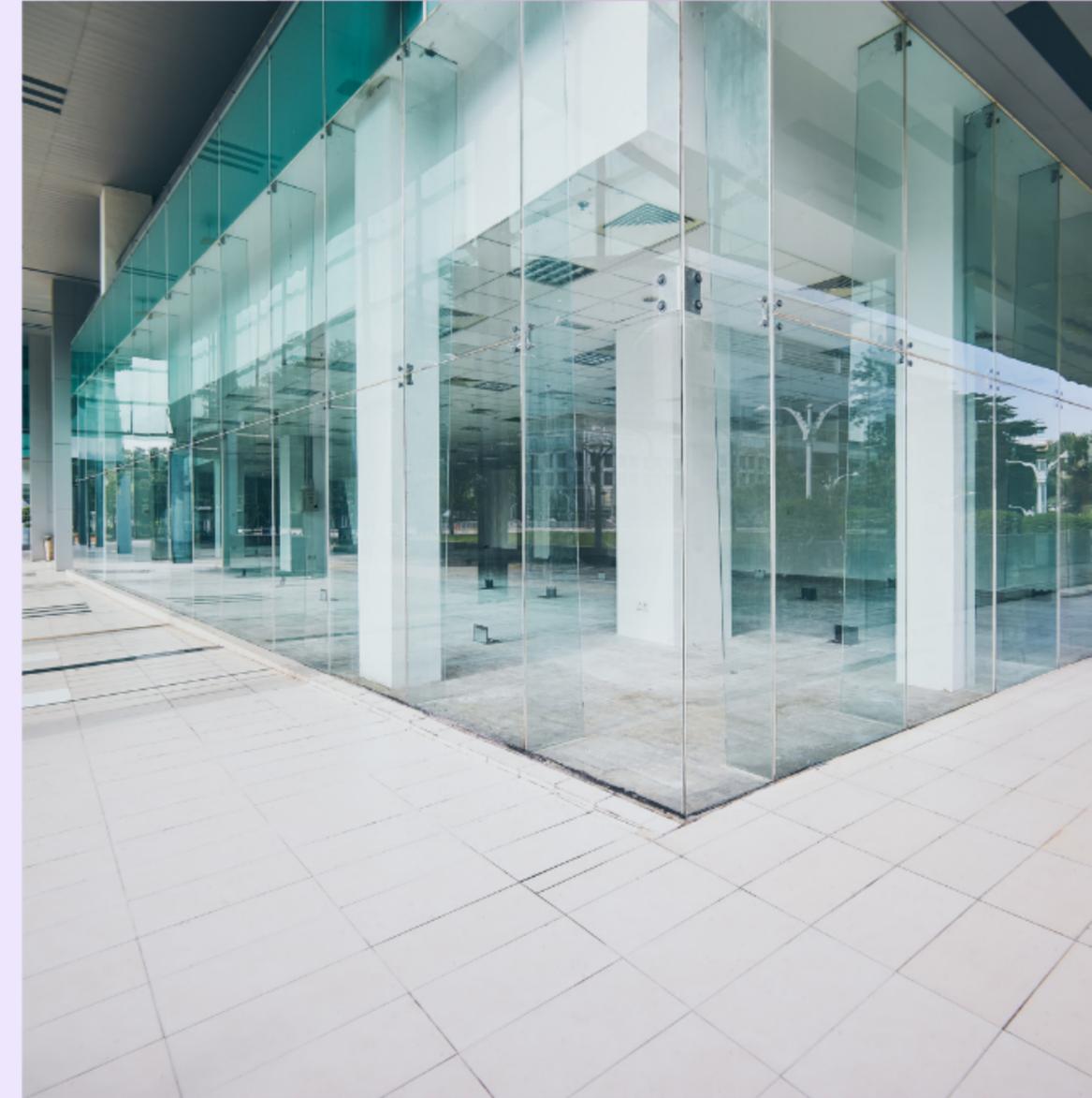
- Introduces fundamental concepts of Building Energy Modeling (BEM).
- Complements existing training on BEM software tools.
- Presents case studies illustrating real-world applications of BEM.
- Uses hands-on exercises to reinforce understanding of BEM principles.
- Key concepts include thermal envelope, energy loads, and simulation algorithms.
- Case studies include net-zero energy buildings and retrofitting existing buildings.
- Encourages critical thinking about energy modeling.
- Aims to contribute to energy-efficient building design and analysis, advancing sustainability and environmental stewardship.

# BUILDING ENERGY MODELING (BEM)

- BEM is a critical process in designing, analyzing, and optimizing energy consumption in buildings.
- The workshop aims to provide comprehensive knowledge about BEM principles, independent of specific simulation software.

## Workshop Objectives

- Introduce fundamental concepts of building energy modeling.
- Complement existing training on specific BEM software tools.
- Present case studies illustrating real-world applications of BEM.
- Utilize hands-on exercises to reinforce participants' understanding of BEM principles.





# KEY CONCEPTS OF BEM

- Thermal Envelope: Understanding how elements interact with external and internal factors.
- Energy Loads: The amount of energy required to maintain a building's desired indoor conditions.
- Simulation Algorithms: Understanding the algorithms behind BEM simulations.



## Complementing Software Training

- Emphasizes a tool-agnostic approach, enabling participants to grasp the underlying principles of BEM.
- Participants can transition more readily between different software packages by understanding the foundational principles.

# CASE STUDIES IN BUILDING ENERGY MODELING

- Examines a case study of a net-zero energy building and a retrofitting of an aging commercial building.

## Hands-On Exercises

- Includes interactive exercises to apply BEM concepts in a practical context.
- Exercise Example: Energy Load Calculation.



# CONCLUSION

The workshop provides a comprehensive overview of building energy modeling principles, empowering participants to contribute to the design and analysis of energy-efficient buildings.



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# THANK YOU

