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# INTERPRETATIONS OF ENERGY MODEL RESULTS

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**ONLINE TRAINING BY KRISHNAJI PAWAR**

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

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MODULE  
**L7**

# Analyzing and Comparing Modeling Results

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# INTERPRETATIONS OF ENERGY MODEL RESULTS

Identifying analysis objectives is crucial for effective simulation, as it ensures relevance and efficacy. For example, an architecture firm might design a new office building with energy consumption analysis, thermal comfort evaluation, and light optimization. Customizing simulations for changes in building use ensures they remain relevant and accurate despite alterations in building use.

# Learning Objectives

- Introduction and Course Outline
- Verification and Fixing of Simulation Results
- **Analyzing and Comparing Modeling Results**
- Economic Analysis
- Sensitivity Analysis
- Exceptional calculation methods
- Building Energy Modeling Project Deliverables
- Interpreting Model Results
- Sample Energy Modeling Report
- Summary and Resources
- BEMP Practice Test V.5.1



## INTRODUCTION

- Utilizes computational algorithms to simulate energy consumption, costs, and comfort levels.
- Essential for architects, engineers, and stakeholders to make informed decisions on energy efficiency strategies, financial investments, and sustainability goals.
- Key metrics include Energy Use Intensity (EUI), Peak Load, Renewable Energy Contribution, and Carbon Emissions.
- Analyzing methods include Sensitivity Analysis, Scenario Comparison, and Benchmarking.
- Effective communication of BEM results is crucial for stakeholder engagement and decision-making.
- Understanding energy modeling principles, metrics, and analytical techniques is essential for effective results analysis.

# ANALYZING AND COMPARING BUILDING ENERGY MODELING RESULTS

- BEM is a tool used to predict energy usage in buildings.
- Models can range from simple spreadsheet calculations to complex software simulations.
- Key metrics in BEM include Energy Use Intensity (EUI), Peak Load, Renewable Energy Contribution, and Carbon Emissions.



# METHODS FOR ANALYZING BEM RESULTS

- Sensitivity Analysis: Assesses how changes in input variables affect the outcome of a BEM simulation.
- Scenario Comparison: Evaluates the relative energy performance of different building configurations.
- Benchmarking: Compares the performance of a building against established standards or similar buildings.



# REPORTING AND COMMUNICATING RESULTS

- Effective communication of BEM results is crucial for stakeholder engagement and decision-making.
- A well-structured report should include an Executive Summary, Methodology, Results, Analysis and Recommendations, and actionable recommendations for energy efficiency improvements.



# ANALYZING SIMULATION OUTPUTS IN BUILDING ENERGY MODELING



- Building Energy Modeling (BEM) is a process used to design, analyze, and optimize energy usage in buildings.
- BEM uses computer-based simulations to predict energy consumption and evaluate design alternatives.
- The simulations provide insights into how factors like building orientation, material properties, HVAC systems, and occupancy patterns affect energy performance.

# UNDERSTANDING ENERGY USE INTENSITY (EUI)

- EUI quantifies the energy consumption of a building relative to its size.
- It serves as a benchmark for comparing the energy performance of buildings of similar types and functions.



# COMPONENT METRICS IN ENERGY MODELING

- Heating and Cooling Loads: Represent the amount of energy required to maintain comfortable indoor temperatures during heating and cooling seasons.
- Lighting Energy Use: Accounts for the energy consumed by artificial lighting systems within the building.
- Plug Loads: Include all non-HVAC electrical loads, including appliances, electronics, and office equipment.
- Renewable Energy Contributions: Analyze their contributions to the overall energy balance.



# ANALYZING SIMULATION OUTPUTS

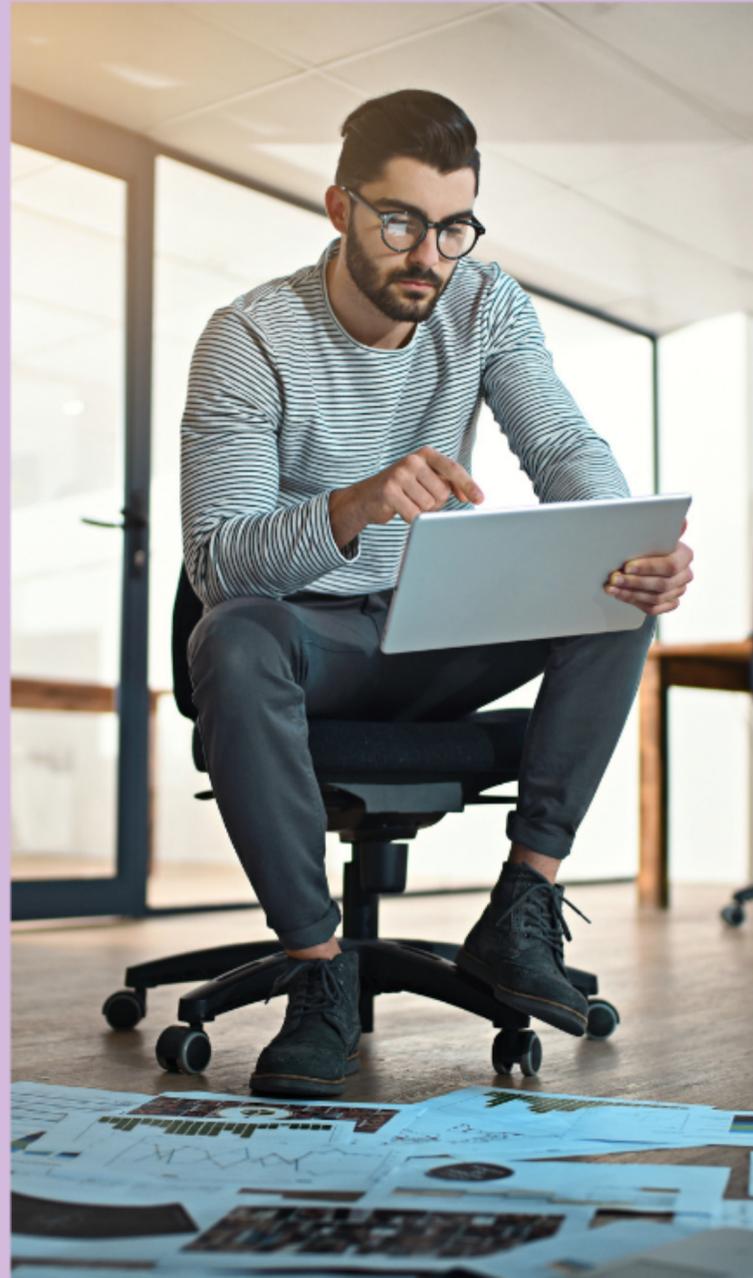
- Data Collection: Gather outputs from the BEM simulation.
- Normalization: Ensure comparability across different buildings or scenarios.
- Benchmarking: Compare the EUI and other metrics against industry standards, local codes, or similar buildings.
- Identifying Trends and Anomalies: Analyze the data for trends over time and identify anomalies.
- Scenario Analysis: Conduct "what-if" analyses to evaluate the impact of different design choices or operational strategies.





# CONCLUSION

- Analyzing and comparing BEM results requires a thorough understanding of energy modeling principles, relevant metrics, and analytical techniques.
- The ability to effectively analyze and communicate BEM results will remain an essential skill for professionals in architecture, engineering, and building management.





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# THANK YOU

