

**BEYOND**  
SMART CITIES

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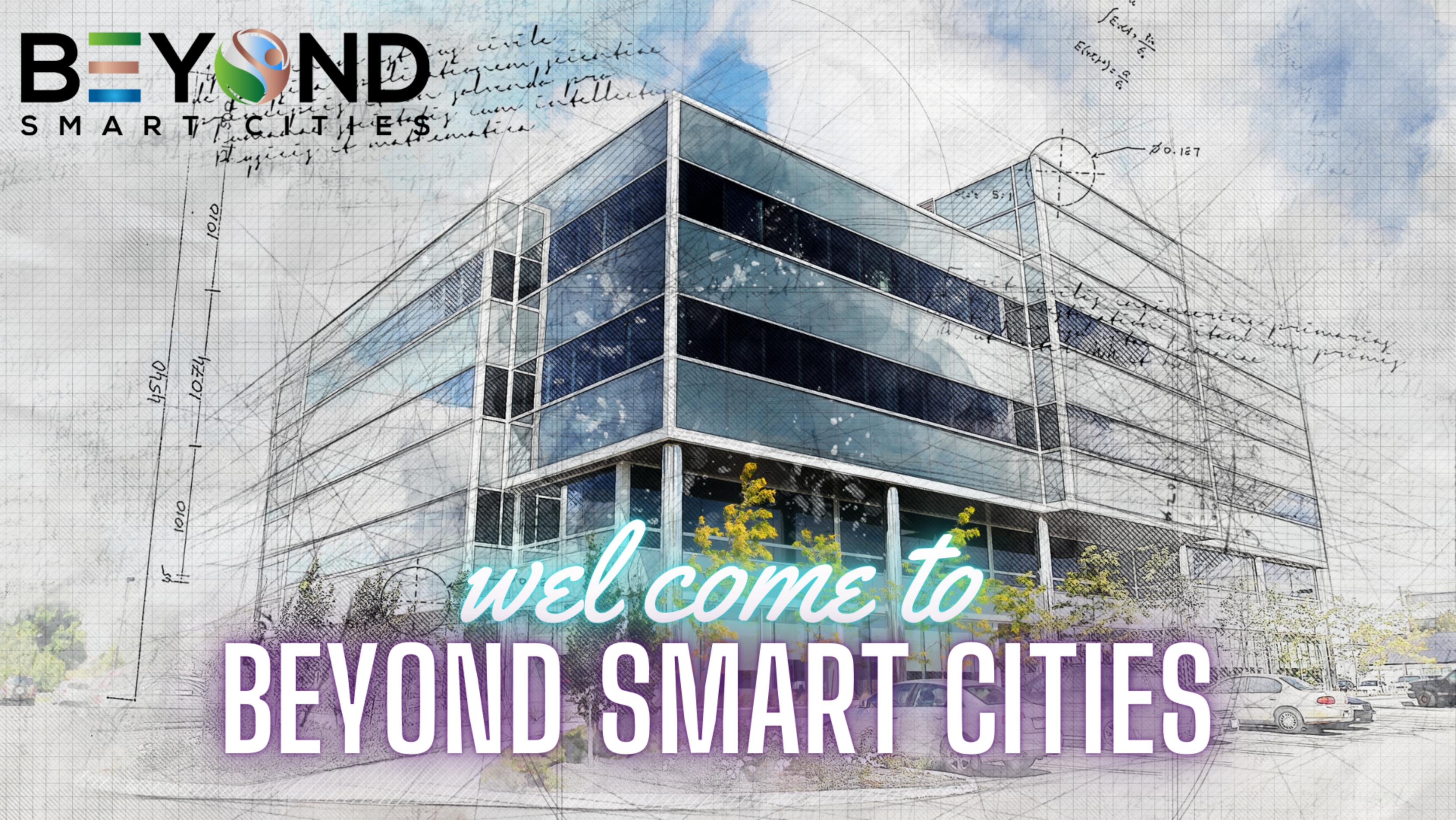
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# APPLICATIONS OF ENERGY MODELS FOR BUILDINGS

ONLINE PROFESSIONAL COURSES LED BY  
THE WORLD'S TOP SPECIALISTS

**ONLINE TRAINING BY KRISHNAJI PAWAR**

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

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MODULE  
**L15**

# Summary and Resources

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# 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

- Designed for professionals in the architecture, engineering, and construction (AEC) industry.
- Focuses on energy modeling's role in optimizing energy efficiency and sustainability in building design, operation, and renovation.
- Covers simulation techniques, performance metrics, communication strategies, team collaboration, and practical applications through case studies.

## Learning Objectives

- Compare simulation results to measured energy data to validate energy models.
- Select appropriate performance metrics for whole-building, component-level, and indoor environmental assessments.
- Identify specific analysis objectives and customize simulations according to project requirements and phases.
- Differentiate between regulated and non-regulated energy use in buildings.
- Communicate analysis results effectively to stakeholders.
- Collaborate effectively within project teams to leverage energy modeling insights.
- Apply energy models to real-world building scenarios through detailed case studies.

# SUMMARY+

## Communication of Analysis Results

- Clear and concise reporting of energy analysis results is crucial.
- Visualization tools like graphs, charts, and dashboards can enhance comprehension and engagement.
- A narrative format linking energy performance to design decisions fosters a collaborative environment.

## Collaboration within Project Teams

- Architects, engineers, and sustainability consultants must work together to align energy models with design intentions and operational realities.
- Regular meetings and workshops facilitate knowledge sharing and foster a culture of collaboration.
- Integrating energy modeling into the design charrette process allows for real-time analysis of design options.



# SUMMARY+

## Applications of Energy Models for Buildings

- Energy models guide design decisions that minimize energy consumption.
- They are required to demonstrate compliance with local energy codes and standards.
- They are required for green building certification programs like LEED.
- They can identify opportunities for retrofits and improvements.
- They can be used post-occupancy to monitor building performance.

### Detailed Case Study

- The energy modeling process includes initial modeling during the design phase, regular updates, and validation against actual energy consumption data.
- Correlating results with LEED prerequisites and credits is crucial.



# RESOURCES

- Performance-Based Building Design book | Hugo S. L. Hens | 2024
- Applied Building Physics book | Hugo S. L. Hens | 2016
- Occupant-Centric Simulation-Aided Building Design book | William O'Brien, Farhang Tahmasebi, William O'Brien, Farhang Tahmasebi | 2023
- Energy Simulation in Building Design book | Joseph Clarke | 2007
- Building Performance Analysis book | Pieter de Wilde | 2018
- Fundamentals of Building Performance Simulation book | Ian Beausoleil-Morrison | 2020
- Building Performance Simulation for Design and Operation book | Jan L.M. Hensen, Roberto Lamberts | 2019
- Energy Modeling in Architectural Design, Timothy L. Hemsath and Kaveh Alagheh Bandhosseini
- <https://www.energy.gov/eere/buildings/building-energy-modeling>
- <https://www.ashrae.org/professional-development/ashrae-certification/certification-types/bemp-building-energy-modeling-professional-certification>



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MODELING  
PROFESSIONAL -  
BEMP EXAM  
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## *Learning Objectives*

- Learn Energy modeling abbreviations.
- Learn high-level energy simulation.
- Examine BUILDING ENERGY MODELING(BEM) in detail.
- Recognize strategies and make informed choices.
- Experience the ASHRAE BEMP exam.
- Know how to respond to circumstances.
- Consider the practice test part of your education.
- BEMP Exam: Flash Cards (One set of key terminology study flash cards. Over 108+ key terms!



## *Who can benefit?*

- Building energy modeling and simulation professionals who want to earn Building Energy Modeling Professional (BEMP) credentials
- Building professionals who want to learn more about energy modeling terminologies and processes
- Individuals seeking a better understanding of HVAC, energy management, and building energy modeling
- For those who are starting their journey in the energy modeling profession.
- Architects, energy engineers, MEP professionals, energy engineers, and building designers

## *Benefits of our simulation exams*

- Check your knowledge before the Building Energy Modeling Professional - BEMP Exam.
- 500+ questions in 5 simulated exams cover BEMP Exam Study Material.
- Learn the reasoning behind each question and answer and the related knowledge to review.
- The exam should be passed on the first try.
- Study Flashcards for the ASHRAE BEMP Exam





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Beyond Smart Cities is the world's 1st Green Technology Marketplace, connecting millions of Sustainability Specialists, Green Building Specialists, Energy Specialists, Commissioning Specialists, Environment Specialists, Health & Safety Specialists, Fire Safety Specialists, Climate Change Specialists & Green Products/Technology Manufacturers with independent talent around the globe.

Our mission is to build and support a global community of experts with the highest professional standards in sustainability, green building, energy, commissioning, environment, health & safety, fire safety, climate change, GHG accounting, carbon auditing, and GHG emissions management.



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