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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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# Defining Model Inputs for Baseline and Proposed Design Models

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# APPLICATIONS OF ENERGY MODELS FOR BUILDINGS

In building energy modeling, it is crucial to distinguish between baseline and proposed design models to ensure a fair comparison between existing and new designs. The baseline model represents a standard building design that adheres to ASHRAE Standard 90.1, while the proposed model reflects the actual design intent of the building, which may incorporate advanced technologies, materials, or systems that exceed the baseline requirements.

# Learning Objectives

- Introduction and Course Outline
- Simulation Comparisons
- Modeling Energy Performance
- Evolution of Simulation Techniques
- **Defining Model Inputs for Baseline and Proposed Design 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

- Baseline model: Standard building design adherence to ASHRAE Standard 90.1.
- Proposed model: Reflects actual design intent, incorporating advanced technologies, materials, or systems.
- Common inputs: Building geometry, climate zone, operational schedules, internal loads.
- Parameters: Proposed model may use advanced HVAC systems, alternative technologies, or renewable energy systems.
- Importance: Understanding and implementing these distinctions is crucial for evaluating energy performance and promoting energy-efficient practices.

# DEFINING MODEL INPUTS FOR BASELINE AND PROPOSED DESIGN MODELS AS PER ASHRAE STANDARD 90.1, APPENDIX G

- Represents a standard building design that adheres to ASHRAE Standard 90.1, serving as a benchmark for energy performance.
- The proposed design model reflects the actual design intent of the building, which may incorporate advanced technologies, materials, or systems that exceed the baseline requirements.



# COMMON INPUTS FOR BASELINE AND PROPOSED MODELS



- Building Geometry: Both models should represent the same volume, floor area, and surface orientations.
- Climate Zone: Both models must be simulated for the same geographic location and associated climate zone.
- Operational Schedules: The operating hours for the building, occupancy patterns, and equipment usage should be identical for both models.
- Internal Loads: The internal heat gains from occupants, lighting, and equipment should be consistent across both models.

# INPUTS THAT CAN DIFFER BETWEEN BASELINE AND PROPOSED MODELS

- HVAC Systems: The proposed model may utilize advanced HVAC systems with higher efficiencies or alternative technologies not permitted in the baseline model.
- Building Envelope: The proposed design may integrate higher-performance insulation, windows with advanced glazing, or other envelope enhancements that exceed the baseline specifications.
- Renewable Energy Systems: The proposed design may include renewable energy sources such as solar panels or wind turbines.
- Lighting Technologies: The proposed design could employ advanced lighting technologies, such as LED systems with integrated controls for daylight harvesting.



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