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APPLICATIONS OF ENERGY MODELS FOR BUILDINGS

Both baseline and proposed design models share input parameters critical for accurate energy modeling, such as building geometry, climate zone, occupancy schedule, internal load profiles, and ventilation rates. These inputs ensure consistency in simulation results and allow for a valid comparison of energy consumption and indoor air quality.

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

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INTRODUCTION

- ASHRAE Standard 90.1, Appendix G, is a benchmark for energy efficiency in commercial buildings.
- Baseline building models are crucial for assessing energy performance of proposed designs.
- Regulated energy use is modeled using prescriptive requirements, while non-regulated energy use is assessed based on actual operational data or industry standards.
- Both baseline and proposed design models share input parameters for accurate energy modeling.
- These inputs ensure consistency in simulation results and allow valid comparison of energy consumption and indoor air quality.
- Comparative analysis between proposed designs and baseline models can yield insights into energy efficiency.

BASELINE BUILDING MODELS AS PER ASHRAE STANDARD 90.1, APPENDIX G

- ASHRAE Standard 90.1 is a benchmark for energy efficiency in commercial buildings in the US.
- Appendix G of Standard 90.1 outlines methodologies for establishing baseline building models.
- Baseline models represent hypothetical buildings that meet ASHRAE Standard 90.1's minimum requirements.
- The baseline model aims to quantify energy savings through improved design strategies, equipment selection, and operational practices.

REGULATED VS. NON-REGULATED ENERGY USE
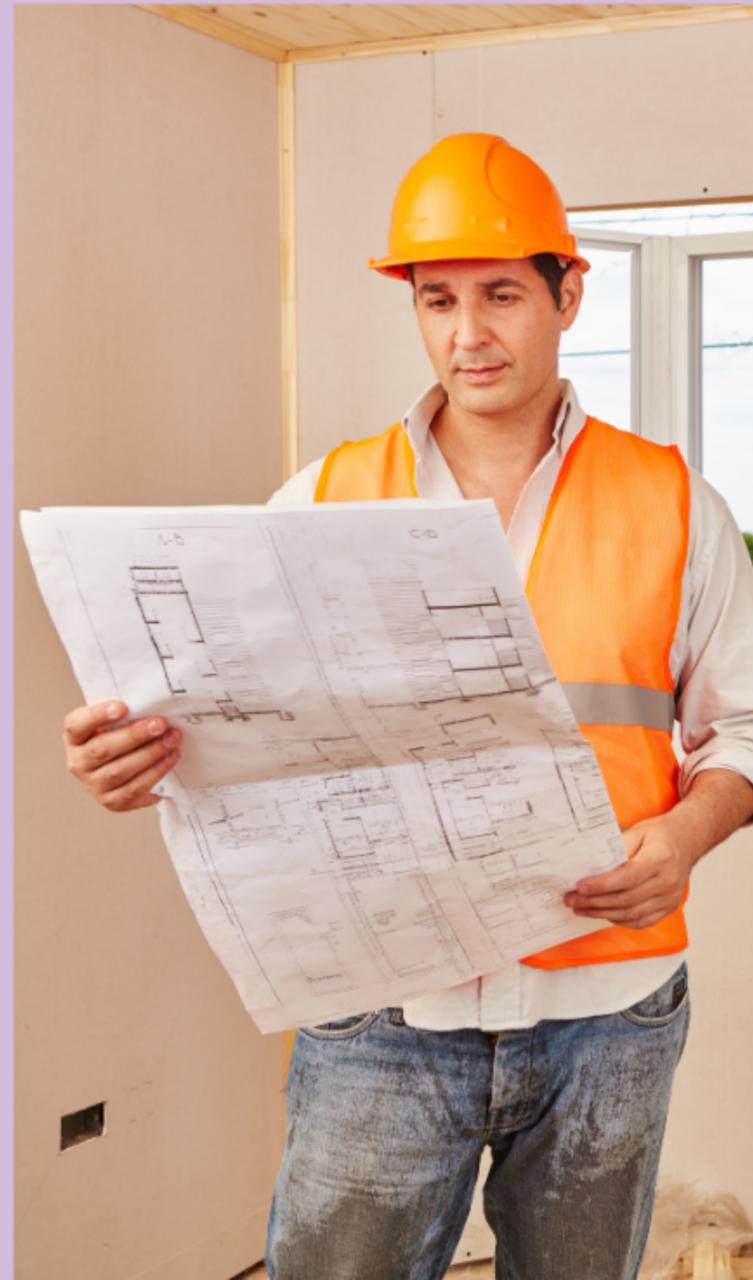
- Regulated energy use includes energy consumption associated with specific building systems and equipment governed by the energy code.
- Non-regulated energy use includes energy consumption not directly controlled by the energy code.
- Non-regulated energy use is often assessed based on actual operational data or industry standards.
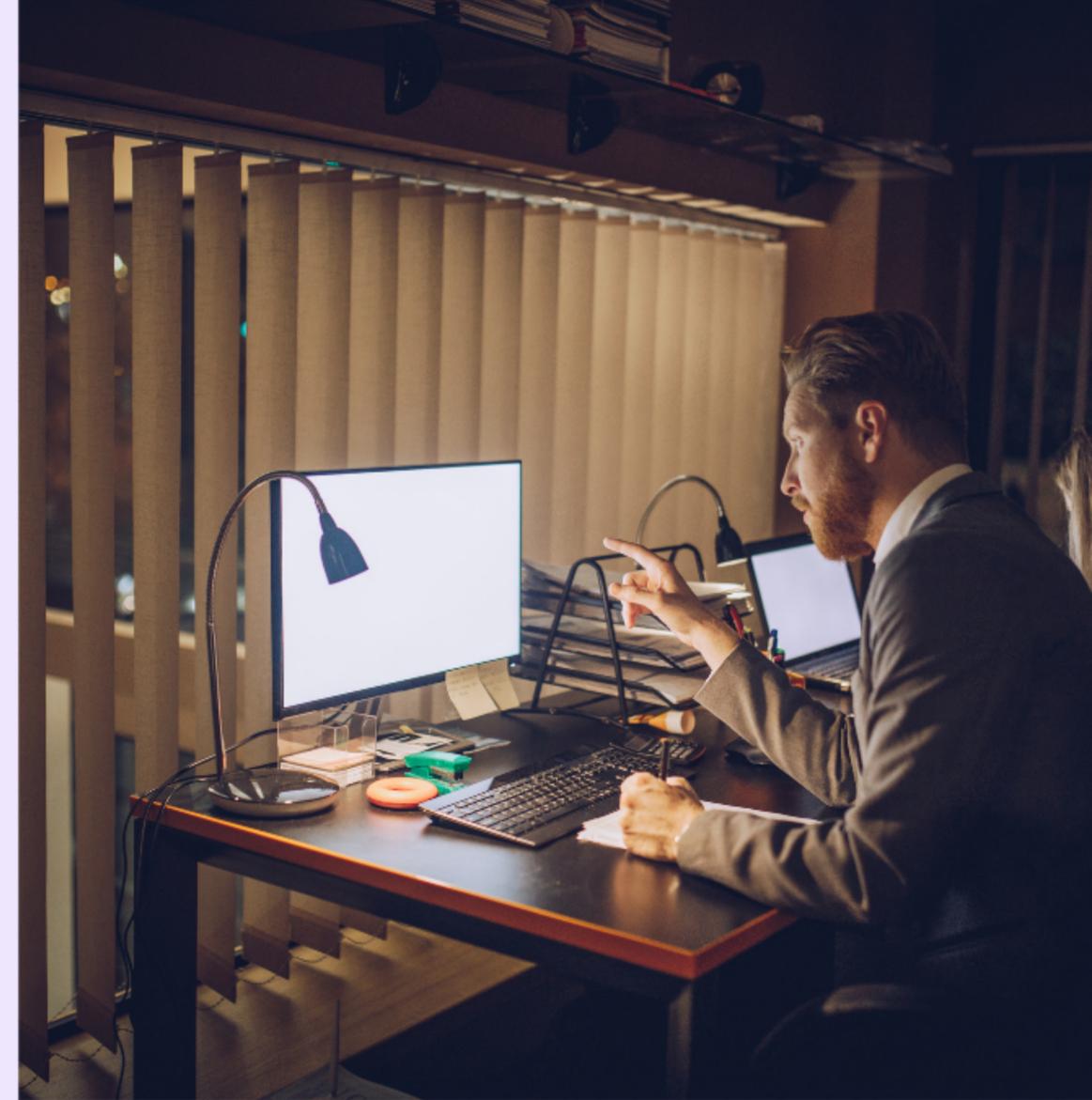
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MODEL INPUTS COMMON TO BASELINE AND PROPOSED DESIGNS

- Building geometry: Both models must reflect the same geometric attributes.
- Climate zone: Both models should incorporate the same climate data to ensure consistency in simulation results.
- Occupancy schedule: Both models should reflect the same occupancy schedule.
- Internal load profiles: Both models should adhere to the same ventilation requirements specified by ASHRAE Standard 62.1.

CONCLUSION

- Baseline building models form the cornerstone of energy performance evaluation in commercial building design.

- Understanding these principles is critical for architects, engineers, and energy analysts committed to achieving sustainable building performance in compliance with established energy codes.

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