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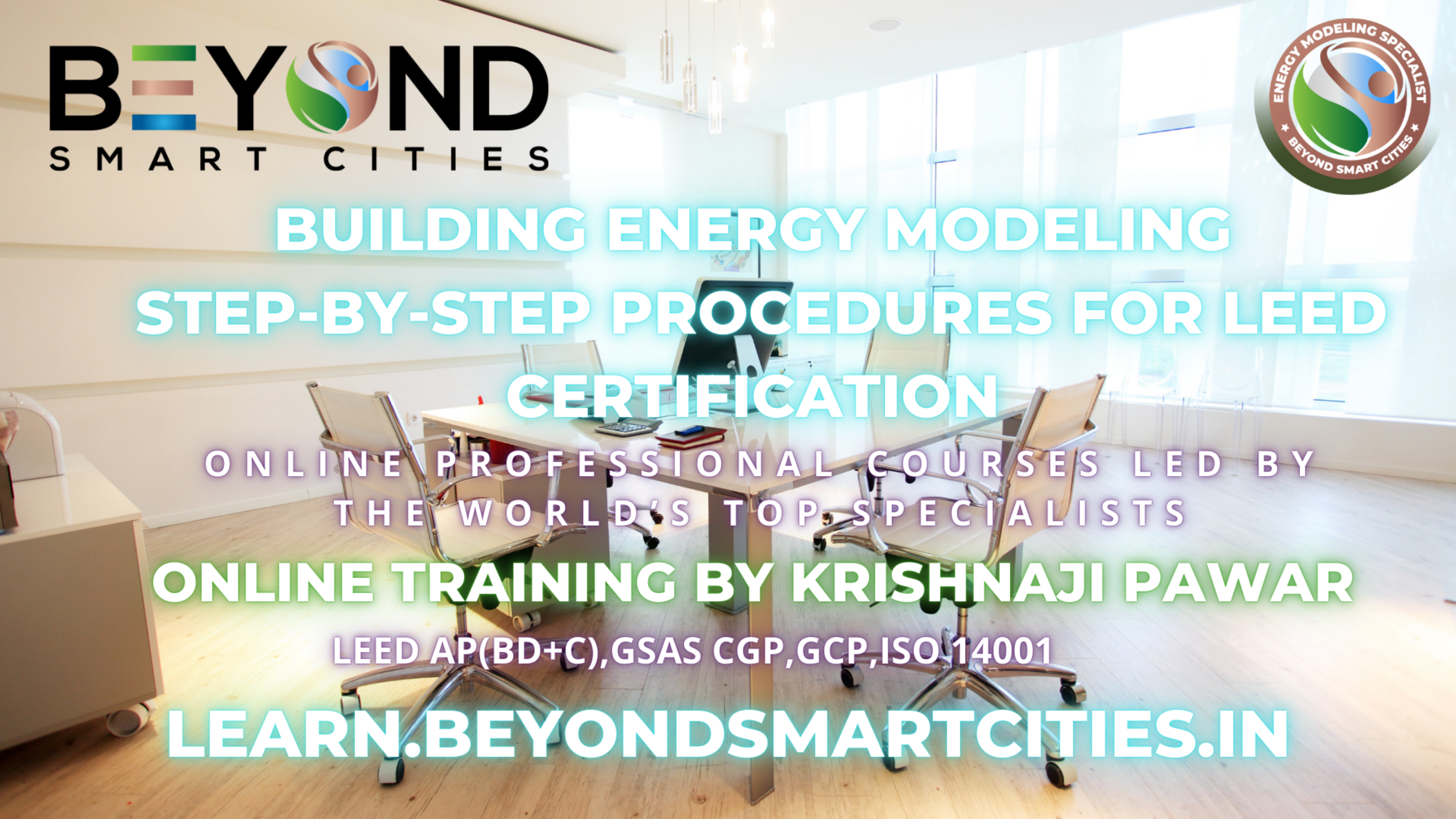
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ENERGY MODELING SPECIALIST
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BUILDING ENERGY MODELING
STEP-BY-STEP PROCEDURES FOR LEED
CERTIFICATION
ONLINE PROFESSIONAL COURSES LED BY
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MODULE L15

BEM software inputs for the project section, facade, systems, & zones

KRISHNAJI PAWAR - CEO & FOUNDER

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

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BUILDING ENERGY MODELING : STEP-BY-STEP PROCEDURES FOR LEED CERTIFICATION

Understanding the inputs for the project section, facade, systems, and zones in BEM software is foundational for accurately simulating a building's energy performance. These inputs allow for a nuanced analysis of how design choices impact energy consumption, ultimately guiding architects and engineers toward more sustainable and energy-efficient building designs.

Learning Objectives

- Introduction and Course Outline
- Building Energy Modeling Checklists
- Scaling an imported drawing from AutoCAD
- ASHRAE Standards and Guidelines
- BEM software inputs for the project section, facade, systems, and zones
- Setup and Running the Building Energy Modeling Simulation
- Review BEM Software Output Reports.
- Sample Energy Modeling Report
- Summary and Resources
- BEMP Practice Test V.4.1

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INTRODUCTION

- Crucial for designing and analyzing energy efficiency in buildings.
- Software simulates energy performance across various scenarios and design choices.
- Key aspects include geographic location, building type, building use and occupancy schedule, facade inputs, systems inputs, and zones inputs.
- Geographic location influences energy performance due to climate variations.
- Building type informs software of expected occupancy patterns, operational hours, and equipment loads.
- Facade inputs include orientation, geometry, material properties, glazing, shading, systems inputs, and zones inputs.
- Energy Modeling Tools: The Project Section: Essential for understanding and predicting energy system performance.
- Requires accurate data input for reliable modeling outcomes.
- Validation processes establish credibility in results.

BUILDING ENERGY MODELING: INPUTS FOR PROJECT SECTION, FACADE, SYSTEMS, AND ZONES

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Project Section

Involves general information about the building project, including location, climate data, and occupancy characteristics.

Key aspects include:

- Geographic Location: The building's location significantly influences its energy performance due to climate variations.
- Building Type: The building type informs the software of expected occupancy patterns, operational hours, and equipment loads.
- Building Use and Occupancy Schedule: Details the intended use of the building and its occupancy schedule help the model predict energy consumption more accurately.

FACADE INPUTS

Influences heat gain and loss through windows, walls, and roofs.

Inputs include:

- Orientation and Geometry: The building's orientation affects solar exposure and heating and cooling loads.
- Material Properties: The thermal properties of materials used in the facade are critical inputs.
- Glazing and Shading: Inputs include:
- Window types, sizes, and shading devices are essential for accurate modeling of daylighting and solar heat gain.

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SYSTEMS INPUTS AND ZONES INPUTS

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HVAC System Type: The type of HVAC system allows the software to model heating and cooling loads accurately.

- Control Strategies: Inputs regarding control strategies directly influence energy consumption.
- Lighting Systems: The type of lighting and its operational schedule must be detailed.

Zone Dimensions and Geometry: Accurate geometric representation of each zone is necessary.

- Internal Loads: The type and usage schedule of equipment and the number of occupants and their activity levels are required.
-Thermal Zoning: Proper thermal zoning allows for efficient heating and cooling strategies.

DEFINITION AND PURPOSE OF THE PROJECT SECTION

- Sets the context for the analysis, allowing the model to tailor its outputs to the specific conditions and requirements of the project.
- Defining Parameters: Enables users to define operational parameters, which directly influence the performance metrics and outcomes of the energy model.
- Facilitates Comparison: Allows for effective comparison between different projects or scenarios, supporting decision-making processes.

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KEY COMPONENTS OF THE PROJECT SECTION

- Project Description: Outlines the narrative overview of the project, outlining its objectives, scope, and significance.
- Location Information: Inputs geographic coordinates, elevation, and local climate conditions.
- Technology Selection: Involves specifying the types of energy technologies to be utilized, such as solar, wind, biomass, or geothermal systems.
- Economic Parameters: Evaluates the financial viability of the project, specifying capital costs, operational and maintenance costs, financing terms, and expected revenue streams.
- Timeframe: Establishes the duration over which the project will be analyzed.

DATA INPUT AND VALIDATION

- Accurate data input is paramount for reliable modeling outcomes.
- Validation processes, such as comparing modeled outputs against historical performance data or benchmark studies, are essential for establishing credibility in the results.

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CONCLUSION

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- The project section in energy modeling tools is a critical element that underpins the analysis of energy systems.
- It enhances the accuracy of modeling outcomes and supports effective decision-making in energy planning and policy formulation.

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CONTACT US

+91 6363032722

info@beyondsmartcities.in

learn.beyondsmartcities.in

#55,HMR Layout ,Bengaluru ,India

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