

BEYOND

SMART CITIES

BUILDING AUTOMATION & CONTROL SYSTEM

CEM REFRESHER TRAINING

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ENERGY MANAGEMENT SPECIALIST CURRICULUM

CERTIFIED BUILDING AUTOMATION SPECIALIST

CBAS

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SMART CITIES

BUILDING SUSTAINABILITY THROUGH

BUILDING AUTOMATION

FOR ENERGY MANAGEMENT SPECIALIST

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WHAT SHOULD YOU LEARN

Enumerate significant factors leading to building sustainability

Justify how building automation can help a facility professional achieve higher energy efficiency

CERTIFIED BUILDING AUTOMATION SPECIALIST

CBAS

BUILDING AUTOMATION SYSTEM (BAS)



✓ A centralized, interlinked, network of hardware and software, which monitors and controls the environment in commercial, industrial, and institutional facilities.

Building Management



✓ Installed in new buildings or as part of a renovation.

✓ While managing various building systems, the automation system ensures the operational performance of the facility as well as the comfort and safety of building occupants.

BAS- TERMS



✓ Building Automation and Control Systems (BACS), Building Control System (BCS), and/or Building Management System (BMS).

✓ Building Operating System (BOS)—a new term introduced by those in the Owner/FM profession

✓ Controls—This term is appropriate in describing discrete devices that control particular pieces of equipment or processes.

✓ Direct Digital Control (DDC)—describes the communication method used in modern devices (hardware and software). Collectively, DDC products control various building systems and form the automation system.

✓ Energy Management System (EMS)—generally understood to be the same as a "Building Automation System" but may have special emphasis on energy metering/monitoring.

✓ Energy Management and Control System—well, you're getting the idea.

✓ Smart (Intelligent) Building—a building equipped with a data-rich BAS.

SUSTAINABILITY



✓ Engaging in practices that lead to long-term viability

✓ Practices that provide for the future without sacrificing the present

✓ End game: a building that requires no more in terms of resources than what it can return

✓ Examples: • Net Zero Energy (Zero-Net Energy; ZNE)
• Living Building Challenge (<http://living-future.org/lbc>)

WHY GO SUSTAINABLE ?

✓ Social or professional responsibility

✓ Environmental stewardship

✓ Green building certification

✓ Regulatory mandates

✓ Promise of cost saving, Image or brand warmth

WHATEVER THE REASON . . .



✓ No matter what propels you toward the sustainability goal, building automation and control systems can contribute greatly to its achievement.

BENEFITS OF BAS FOR GREEN BUILDINGS

✓ Building automation can benefit your green building in a number of ways.

✓ Let's look at four important benefit categories:

- Higher Energy Efficiency
- Lower Operating and Maintenance Costs
- Better Indoor Air Quality
- Greater Occupant Comfort and Productivity

HIGHER ENERGY EFFICIENCY—PRACTICES



✓ Scheduling

- Purpose: To avoid the costs associated with unnecessary lighting or space conditioning (i.e. temperature, humidity, air quality).
- Avoids wild swings in runtime for mechanical equipment (optimizing start/stop times for occupied periods)
- Levels out associated demand for energy (electricity, gas, water)
- Surprisingly, many pieces of mechanical equipment remain unscheduled, have their schedules overridden, or are programmed incorrectly.
- 10% (or more) energy savings can be achieved through scheduled control alone.

HIGHER ENERGY EFFICIENCY—PRACTICES



✓ Occupancy-Based Control

- Easy to achieve through occupancy sensing.
- Can be supported or verified through security/ access systems such as card swipes and CCTV.
- Occupancy-based lighting control is most common; Occupancy-based control through integrated systems (Lighting + HVAC or Lighting + HVAC + Security) are also common.
- Self-learning (or Adaptive) occupancy sensing is also possible.
- Combine occupancy sensing with scheduling for best results.

HIGHER ENERGY EFFICIENCY—PRACTICES



Misc

- Proper implementation of advanced, demand- based zoning systems such as VAV and chilled beam, can create a good deal of energy savings.
- Coupling these strategies with proper static pressure control of the supply air (such as with VFDs on the fans) results in further energy efficiencies.
- Consider practices that involve resetting the various air stream temperatures, supply water temperatures, and cooling tower condenser temperatures to optimum setpoints as the dynamic loads change.
- Lighting controls reduce unnecessary artificial lighting via motion sensors and schedules as well as by controlling daylight harvesting louvers.
- A control system saves water and energy by controlling rainwater harvesting and landscape irrigation.

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THANK YOU

**THE WORLD'S 1ST GREEN TECHNOLOGY
MARKETPLACE**
