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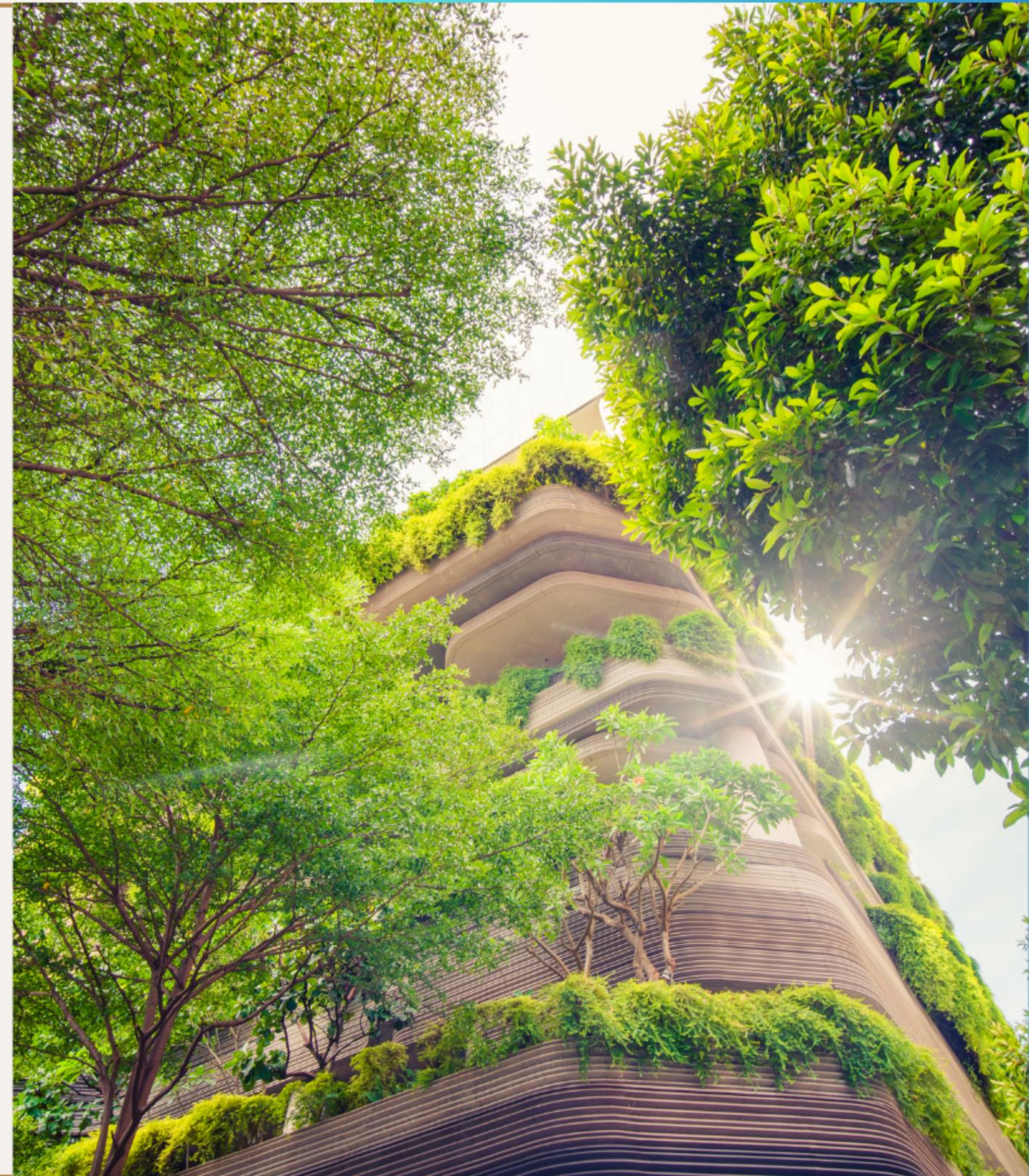
MODULE
16

Energy Efficiency(Plug Loads & HVAC Systems)

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"Energy Efficiency—Plug Loads & HVAC Systems in School Buildings" discusses the importance of energy conservation in school buildings. Plug loads refer to the energy consumed by electrical devices connected to electrical outlets, such as computers, projectors, printers, and other electronic equipment commonly used in classrooms and administrative offices.

Learning Objectives

- Green school buildings are dynamic learning environments.
- Operations and Maintenance for Whole School Sustainability
- Meaningful, purposeful, and engaging learning
- Sustainable Spaces and Smart Transportation
- Energy Efficiency - Lighting
- Energy Efficiency - Plug Loads & HVAC Systems
- Water Efficiency and Quality
- Indoor Environment: Air Quality and Acoustics
- Smart Cleaning & Integrative Pest Management
- Materials and Resources
- Emerging Design and Technology
- Summary and Resources
- SCS Quiz: Test Your Knowledge!

INTRODUCTION

Plug Loads:

- Energy consumed by electrical devices connected to outlets.
- Account for 20-40% of total energy consumption in commercial buildings.
- Strategies include investing in energy-efficient equipment, using smart power strips, and educating staff about equipment usage.

HVAC Systems:

- Account for 30-50% of total energy consumption.
- Improving efficiency involves technology, maintenance, and operational practices.
- Regular maintenance, upgrading to modern, energy-efficient units, smart controls, and Demand-Controlled Ventilation can reduce energy use.



UNDERSTANDING PLUG LOADS



- Plug loads refer to the energy consumed by electrical devices connected to electrical outlets.
- They account for 20-40% of the total energy consumption in commercial buildings, including schools.
- Examples of plug loads in school settings include computers and monitors, projectors, printers, and copiers.

STRATEGIES FOR REDUCING PLUG LOADS

- Invest in ENERGY STAR-rated devices to reduce energy consumption.
- Use smart power strips to automatically cut off power to devices not in use.
- Educate staff and students about the importance of turning off equipment when not in use



OVERVIEW OF HVAC SYSTEMS



- HVAC systems are integral to maintaining a comfortable indoor environment in school buildings.
- Components of HVAC systems include heating equipment, cooling equipment, and ventilation.
- Strategies for improving HVAC efficiency include regular maintenance, upgrading systems, smart controls and zoning, and Demand-Controlled Ventilation (DCV).

HEATING AND COOLING BEST PRACTICES IN EDUCATIONAL ENVIRONMENTS

Understanding HVAC Operations

- Use a "Get to Know Your Classroom" checklist to familiarize with HVAC systems.
- Checklist should cover temperature adjustment, time schedules, and outdoor weather response.

Temperature Regulation

- ASHRAE recommends maintaining classroom temperatures between 68°F (20°C) for heating and 78°F (26°C) for cooling.
- Encourage students to dress appropriately for seasonal changes.



IMPROVED INSULATION TECHNIQUES

- Reduce heat loss by closing window shades during non-operational hours.
- Large west-facing windows can mitigate solar heat gain.

Identifying and Reporting Drafts

- Educators should report potential energy loss sources.

Navigating Energy Trade-Offs

- Balance aesthetic and cognitive benefits of natural light with potential for increased energy use.
- Excessive window opening can cause discomfort.



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