

Building Technologies Program

EnergySmart Hospitals: Retrofitting Existing Facilities

“Quick Win” Energy Efficiency Tips for Facility Managers and Operators

EnergySmart Hospitals has developed the following tips—on lighting, HVAC, building envelope, and plug loads/water efficiency—to assist hospital facility managers and operators in getting started on an energy management program and producing some “quick wins” for energy- and cost-savings, as the program builds and strengthens.

Lighting

Begin by upgrading lighting technology in areas that offer the best opportunity and fastest return on investment:

- Upgrade all exit signs with light emitting diodes (LED)—these can last up to 25 years
- Replace older T-12 fluorescent lamps with “super” T-8 lamps and high efficiency electronic ballasts, reducing energy usage by 20-30 percent
- Eliminate incandescent lamps where feasible and replace with compact fluorescents (CFLs) that use a quarter of the electricity and last up to 10 times longer

- Install occupancy sensors in rooms that are frequently unoccupied
- Investigate the use of daylighting sensors in patient rooms and public spaces with large window areas (lobbies, meeting rooms)
- Track maintenance on different types of bulbs and ballasts to identify any consistency issues or manufacturing problems—frequently these issues go unnoticed and result in a significant waste of energy and money in continuously replacing the same fixture
- Consolidate lamp inventories by eliminating unnecessary bulb types (different bulbs with same purpose); limit the addition of any new bulb types as much as possible when renovating a facility
- Adopt a period of “downtime” lighting, reducing the overall lighting levels to allow for patients to rest while also lowering energy usage
- Provide “cheat sheets” with pictures and installation instructions for different ballast and bulb types to help facility operators with maintenance

HVAC

Regardless of size, a hospital’s heating, ventilating, and air-conditioning systems represent a large portion of energy use and therefore energy costs. Regular monitoring and maintenance are two important steps toward improved energy management:

- Calibrate, check, and adjust thermostats to accurately heat and cool different building zones; implement set-back strategies to reduce HVAC use during low-use or unoccupied hours
- Look for and correct any HVAC systems that are fighting each other with simultaneous heating and cooling, such as humidity control fighting a static control
- Schedule and perform regular maintenance on key HVAC units:
 - Clean/replace air filters and dampers to ensure top HVAC performance
 - Inspect ducts and pipe insulation for damage and repair/replace as needed
- Improve performance of heating and cooling systems:
 - Clean heat transfer coils on chillers, heat pumps, and air conditioners to ensure high operating efficiency
 - Monitor ΔT on the chilled water system to determine when it needs to be upgraded or replaced
 - Maintain/repair steam traps of boilers
 - Clean boiler tubes and combustion surfaces of fouling
 - Install automatic blow down controls on boilers

Mercy Medical Center

Roseburg, Oregon • 2000 – 2004



Northwest Energy Efficiency Alliance

A 286,000 square foot Trauma III hospital, Mercy underwent several energy efficient upgrades, including replacing old T-12 lamps with T-8 Electronic Ballasts, installing modular condensing hot-water boilers and upgrading three old R11 chillers with two high-efficiency VFD units.

Financial Analysis:

- Project Cost: \$650,000
- Annual Energy Savings: \$71,300
- Reduced Maintenance Cost: \$20,000
- Utility Incentives: \$118,680

Building Envelope

- Tune up key building envelope features:
 - Repair or replace “leaky” windows and doors to reduce energy losses and make sure all doors and windows close tightly
 - Regularly check caulking and weather stripping for leaks
- Keep external doors closed when possible, especially during high- and low-temperature periods
- Provide energy efficient checklists to ensure equipment is operating at intended energy levels

Plug Loads/Water Efficiency

- Reduce energy use of plug loads:
 - Use ENERGY STAR® rated equipment (copiers, computers, printers)
 - Enable ENERGY STAR settings, as available, on all equipment
 - Install vending misers on vending machines
- Install insulation around domestic hot water tanks and pipes to reduce their energy losses to the surrounding environment

- Train staff in more efficient operation of cleaning equipment in kitchen and laundry areas
- Investigate the use of heat exchangers to capture heat from hot wastewater

Creating an Energy Management Program

Hospitals can proactively manage energy use by developing a comprehensive Energy Management Program. Once such a program is in place, information on energy use will generate savings from reduced utility costs that can be redirected to mission-critical needs, provide indicators to perform predictive maintenance and reduce equipment downtime, and create an energy efficiency mindset that will contribute to a more comfortable environment, promoting faster healing and increased staff satisfaction.

Step 1: Work with upper management to establish an Energy Management Steering Committee with wide representation from across the organization (maintenance and facilities, finance, purchasing, quality assurance, medical personnel).

Step 2: Help the committee develop a strategic plan and set goals in conjunction with hospital’s primary mission and existing greening efforts.

Step 3: Initiate, track, and re-evaluate a comprehensive “whole-building” energy management program, addressing all appropriate building systems.

Step 4: Use integrated building design strategies in any future renovation or design projects.

A Strong Energy Portfolio for a Strong America

Energy efficiency and clean, renewable energy will mean a stronger economy, a cleaner environment, and greater energy independence for America. Working with a wide array of state, community, industry, and university partners, the U.S. Department of Energy’s Office of Energy Efficiency and Renewable Energy invests in a diverse portfolio of energy technologies.

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