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HEALTHCARE ENGINEERING



# ISHE Issues

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50 Ways to Green Your Hospital

# 50 WAYS TO GREEN YOUR HOSPITAL

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**T**he cost of energy and world consumption continues to increase. Now is the time for hospital management to work with facility engineers, maintenance staff and others to explore innovative solutions and green practices to help manage operational costs.

A smart approach is to implement green practices incrementally by exploring what can be done in the short term (0-3 years), near term (3-8 years), long term (more than 8 years), and on a going-forward basis. To help anticipate areas within facilities to look at for savings and future areas of investment, we've assembled the following "50 Ways to Green Your Hospital."

By implementing some of these tips, hospitals can easily save between 10 and 25 percent annually on their energy bill. And even small changes can add significant budget savings to the bottom line. Let's get started:

## SHORT TERM PAYBACK PLAN: 0-3 YEARS

Quick changes and low or no cost facility areas to look at that can help yield instant savings. Often these tips will provide the biggest bang for your buck.

### Building Envelope

1. Find and fix leaks (doors and windows)

### Lighting

2. Install occupancy sensors
3. Retrofit existing lighting fixtures (T12 – T8)

### Motors

4. Properly size to the load for optimum efficiency
5. Check alignment
6. Check for under-voltage and over-voltage conditions

### Pumps

7. Operate pumping near best efficiency point
8. Modify pumping to minimize throttling
9. Adopt to wide load variation with variable speed drives
10. Use booster pumps for small loads requiring higher pressures
11. Repair seals and packing to minimize flows and reduce pump power requirements

### Controls/Automation

12. Check schedules, setpoint and setbacks
13. Confirm HVAC/Refrigeration control strategies are correct/operational
14. Check/inspect/repair equipment for proper operation (fans, dampers, belts, filters, VAV boxes, etc.)
15. Use "free cooling" when using your chilled water system in cold weather

### Steam

16. Fix steam leaks and condensate leaks
17. Inspect steam traps regularly and repair malfunctioning traps promptly

### Boilers

18. Preheat combustion air with waste heat
19. Use variable speed drives on larger boiler combustion air fans with variable flows
20. Inspect and clean burners, nozzles
21. Close burner air and/or stack dampers when off
22. Automate boiler blow-down and recover blow-down heat
23. Use boiler blow-down to help warm the back-up boiler
24. Inspect door gaskets
25. Optimize boiler water treatment
26. Add an economizer to preheat boiler feedwater using exhaust heat- Recycle steam condensate

## Water and Sewer

27. Recycle water, especially if sewer costs are based on water consumption
28. Use the lowest possible hot water temperature
29. Fix water leaks
30. Use water restrictions on faucets, showers and/or install self-closing type faucets in restrooms
31. Verify water meter readings

## NEAR-TERM PAYBACK PLAN (3-8 YEARS)

You've looked at the easy stuff, now take a hard look. These suggestions are investments or changes that still have attractive payback, but take more time to investigate.

### Equipment Change Out

32. Evaluate your chilled water system to specifically consider replacement of chiller(s) with more efficient models
33. Study gas-powered refrigeration equipment to minimize electrical demand charges
34. Assess new HVAC system
35. Replace boilers (higher efficiency, modular, etc.)
36. Consider installing: thermal storage systems, heat recovery systems

### Operational Strategies

37. Determine optimum building automation/control strategies and implement –
38. Consider different utility purchasing options, rate analysis and/or buying utilities on the commodity market
39. Ensure high efficiency motors are matched to size/loads
40. Optimize compressed-air equipment for maximum efficiency through leak analysis and end-use requirements assessment
41. Study part-load characteristic and cycling costs to determine most efficient mode for operating multiple boilers
42. Consider more efficient options (don't use the main heating boiler) for domestic hot water during the cooling season

## LONG-TERM PAYBACK PLAN (MORE THAN 8 YEARS)

For those looking to make a long-term investment in their facility, consider the following tips:

### Equipment Change Out

43. Consider new chilled water system
44. Implement major HVAC system replacements
45. Install new or upgrade controls/facility automation system
46. Install a geothermal heat pump system

### Operational Strategies

47. Assess and verify reliability/availability of utilities (on-site generation)
48. Study facility envelope (windows, doors and roof) and make necessary improvements

### Renewable Energy Solutions

49. Study the benefits of adding some renewable technologies such as: solar, wind, biomass

## ONGOING

### Maintenance

50. Engage in proactive maintenance for sustained performance

Making facility improvements of any kind can help hospitals achieve better performance and have a positive effect on budgetary resources. Of course, individual results and cost savings are dependent on each unique facility situation, utility costs and specific areas of investment. And while there could be higher initial costs, green design, upgrades and operations can help create cost savings that almost always pay for the added costs. But in the end, a green facility creates healthier and more resource-efficient models of construction, renovation, operation and maintenance – not to mention a more enjoyable and productive healing environment for patients and healthcare providers.

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*About the author: Dave Sommer is the business leader for the Trane commercial systems business in Indiana, responsible for providing building owners and their influencers with energy efficient heating,*



