Profiles in Performance

How Two Hospitals Rose from Mediocrity to Excellence

Money Isn't All You're Saving

The U.S. Environmental Protection Agency's (EPA) national energy performance rating system enables building managers to see how their facilities measure up to their peers nationwide. To date, over 1,300 commercial buildings across the country — including twenty-nine hospitals — have earned EPA's ENERGY STAR® label by ranking in the top 25% in terms of energy performance. Although most who use EPA's rating system discover their facilities are not eligible for the ENERGY STAR, they nevertheless use their rating as a baseline to measure energy performance improvements over time.

In this article, we highlight two hospitals that earned the ENERGY STAR label by implementing low cost operations and maintenance practices and technology upgrades to reduce consumption in addition to energy contract negotiations to reduce energy costs by 40%. These results are impressive not only for the magnitude of the energy saved, but also for the time span in which they were made. In both cases, the hospitals were able to achieve significant savings in a little over a year. How did they do it?

Shriners Hospitals for Children – Houston, Texas

Built in 1996, the Shriners Hospitals for Children in Houston is a 248,775 square-foot facility dedicated to providing free pediatric orthopedic healthcare services to children. Facility energy performance is a responsibility shouldered by Delbert Reed, the Director of Engineering/Maintenance and Energy Manager, along with support from four engineers and three other staff. Together, they have assessed multiple energy saving opportunities as part of Shriners "Energy Management Initiative", a program that saved the hospital 40% in energy costs since 1997.

After attending EPA's benchmarking training session at ASHE's 2002 annual conference, Reed compared the facility's performance with similar facilities nationwide using EPA's free rating system, found in Portfolio Manager at www.energystar.gov/benchmark. On ENERGY STAR's 1 – 100 performance scale, Reed found his facility rated a 42, eight points below the industry average of 50. In essence, Shriners-Houston was using energy less efficiently than 58% of its peers.

Facilities with ratings below industry average are good candidates for capital improvements. Reed surveyed and analyzed space-use patterns throughout the hospital and realized that substantial amounts of energy could be saved in areas of the hospital where conditioning requirements vary. His conclusions convinced senior management to augment the existing HVAC system with a 1.5-ton unit to condition the 24-hour security office, creating more efficient after-hours operations.

With the enhanced split-HVAC system in place, Reed invested in training to ensure that key personnel knew how to operate and maintain the new system. HVAC certification and refrigeration maintenance were considered essential to optimize performance. In addition, Reed used local service providers to install upgraded chilled water pumps and new variable frequency drives. He also balanced the air and water systems, installed lighting controls and mechanical timers, and scheduled the air handlers and lighting to match operational hours.

After incorporating these changes, the energy performance rating at Shriners – Houston climbed 33 points (to a 75) in one year, putting them in the top quartile of energy performers across the country. For this achievement, EPA awarded Shriners - Houston the ENERGY STAR label in 2003. Senior management was pleased with federal recognition of their facility as well as the 24% savings in energy consumption (and additional savings through energy contract negotiations) that went directly to their bottom line.

"Some facility managers say they don't have time to look into energy saving measures", says Delbert Reed, "but I see how these technologies and operational changes have saved us money every single month. You can't control how much utilities cost, but you can control how efficiently you use what you buy."

Shriners Hospital for Children-Houston Efficiency Measures

- **Lighting** — set schedules (on-off), LED exit signs; occupancy sensors in public areas and mechanical timers in non-public areas
- **Fan Systems** — Balanced the air and water throughout the hospital, installed energy efficient motors and VFD's
- **HVAC** — scheduling, installed split A/C system, installed new energy efficient motors, installed two new chilled water pumps

St. Francis Hospital – Maryville, Missouri

St. Francis Hospital is a 150,000 square foot acute care facility built in 1968. Gary Thompson, the facility manager, oversees a staff of six. After meeting with ENERGY STAR representatives at the ASHE conference in 2002, Thompson benchmarked his hospital's energy performance and received a rating of 51, slightly better than the industry average. To pinpoint the best opportunities for energy efficiency improvements, Thompson and his team began evaluating every building system and documenting the benefits each would receive from upgrades. With detailed information in hand about the potential for dollar savings and increased patient comfort levels, Thompson briefed senior management and obtained their buy-in on upgrade plans.

Throughout 2002, the main focus of the upgrades centered on the facility's boilers. Two boiler burners were exchanged and recaptured heat was fed back into the de-aerator tanks, raising efficiency from 30% to nearly 90%. Lowering the pressure of high-pressure boilers from 100 to 50 p.s.i. reduced operating times (and related maintenance expenses) by four hours per day. Thompson's team also added new controls to better manage water temperature and reduce water use.

The project also enhanced quality control. Thompson's team discovered an incorrectly installed heat exchanger; when fixed, it was able to receive 50% more heat exchange than in the old configuration.

St. Francis is beginning to phase out T-12 lamps as well. Whenever these lamps burn out, they are being

ENERGY STAR-labeled hospitals are hospitals that demonstrate energy performance in the top 25% of hospitals nationwide. The U.S. EPA recognizes the following hospitals for their environmental leadership through superior energy performance for the years listed below.

Community Hospitals

- Lemay Campus, Poudre Valley Health System, Fort Collins, CO - 2003
- Memorial Hospital of Carbondale, Carbondale, IL – 2001, 2003
- Sacred Heart Medical Center, Spokane, WA - 2003
- St Francis Hospital and Medical Center, Hartford, CT - 2003
- St Francis Hospital and Health Services, Maryville, MO - 2003
- Shriners Hospital for Children, Houston, TX - 2003
- Sierra Nevada Memorial Hospital, Grass Valley, CA - 2003
- St. Joseph's Medical Center, Yonkers, NY - 2001

Indian Health Service Hospitals

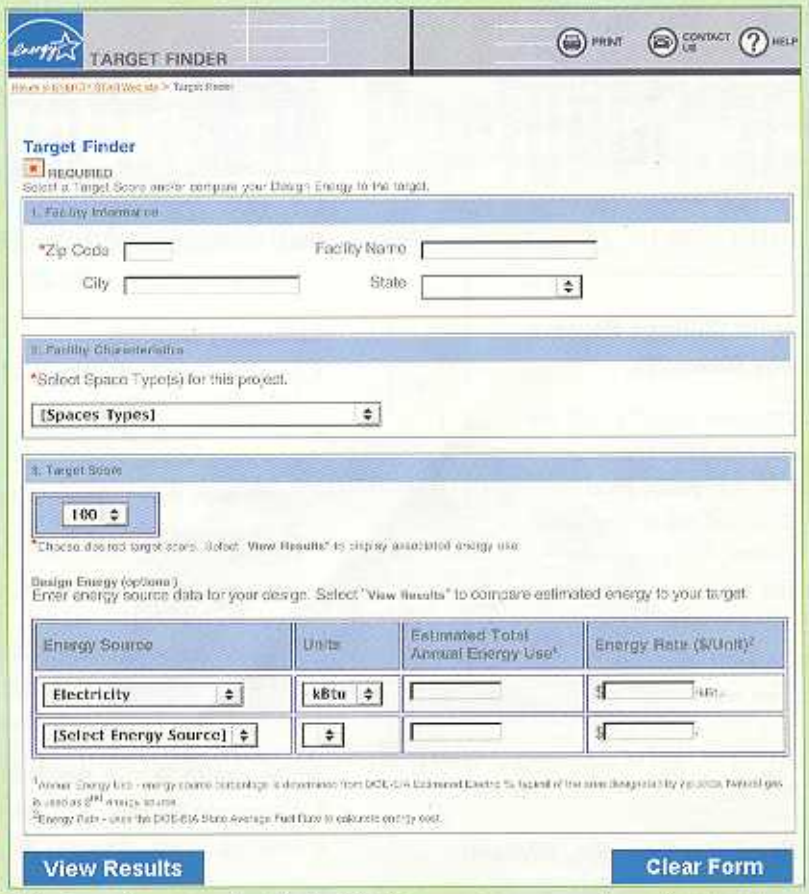
- Albuquerque Indian Hospital, NM - 2002
- Blackfeet Hospital, Browning, MT - 2002

Navy Hospitals

- Naval Medical Center, San Diego, CA - 2001

Veteran's Affairs hospitals

- VA Boston Healthcare System, Jamaica Plain, MA - 2003
- VA Connecticut Healthcare System, West Haven, CT - 2002
- VA Johnson Medical Center, Clarksburg, WV - 2002
- VA Philadelphia Medical Center, Philadelphia, PA - 2002
- VA Pittsburgh Healthcare System, Pittsburgh, PA - 2002
- VA Medical Center/Regional Office Center, Wilmington, DE - 2002
- VA Medical Center, Richmond, VA - 2002
- VA Northern Indiana Healthcare System, Fort Wayne, IN - 2003
- McClellan Memorial Veterans Hospital, Little Rock, AK - 2002
- New Mexico VA Healthcare System, Albuquerque, NM - 2003
- Northern Arizona VA Healthcare System, Prescott, AZ - 2002
- Southern Arizona VA Healthcare System, Tucson, AZ - 2002
- VA Montana Healthcare System, Fort Harrison, MT - 2003
- VA Puget Sound Healthcare System, Seattle, WA - 2002
- Boise VA Medical Center, Boise, ID - 2002
- Portland VA Medical Center, Portland, OR - 2002
- VA Palo Alto Healthcare System, Palo Alto, CA - 2002
- VA Medical/Regional Office Center, Fargo, ND - 2003



EPA's free rating system, found in Portfolio Manager at www.energystar.gov/benchmark

St. Francis Hospital and Health Services Efficiency Measures

- **Commissioning** — Boiler/Burner tune-up
- **Lighting** — T-8 lamps
- **Load Reductions** — ENERGY STAR equipment policies
- **Fan Systems** — CAV to VAV
- **Heating and Cooling Plant** — High efficiency chillers
- **Other technologies** — Co-generation

replaced with more efficient T-8s and electronic ballasts.

The other major installation in 2002 was a high efficiency cooling tower. These upgrades, coupled with a new procurement policy requiring the purchase of ENERGY STAR-qualified office equipment where applicable, cut St. Francis' electrical bill by 17% and its gas bill in half. St. Francis' energy performance now rates at a 91, rising 40 points over the course of the year. It is the first hospital in Missouri and the SSM Health system to earn the ENERGY STAR.

"Implementing energy performance improvements generates savings that can be used to improve patient services," says Gary Thompson, "and there's still more that can be done. We're looking to improve our air handling system as we prepare to build a new hospital wing to further our mission of providing exceptional healthcare services."

ENERGY STAR provides hospitals a wealth of information and tools to assess and increase energy performance. You can read additional Profiles of ENERGY STAR-labeled hospitals by visiting www.energystar.gov. Under "Business Improvement" click on "Find Labeled Buildings" and then select "Hospital" under Building Type.

Clark Reed is the National Healthcare Manager for ENERGY STAR at the U.S. EPA. Last year, we helped Americans save the energy to power about 15 million homes while reducing greenhouse gas emissions equivalent to those of 15 million automobiles. To join, visit ENERGY STAR's website or contact the author at the U.S. Environmental Protection Agency - MC 6202J, 1200 Pennsylvania Ave NW, Washington, D.C. 20460. Email: reed.clark@epa.gov Phone: 202-343-9146.