



ENERGY TO CARE *SUCCESS STORY*

MIDLAND MEMORIAL HOSPITAL

Accountability and education empower to save energy, celebrate successes, and win national recognition.

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MIDLAND MEMORIAL HOSPITAL

Community Owned Nonprofit Hospital

Location: Midland, Texas | **Square Footage:** 781,400 sq. ft. | **Licensed Beds:** 474

Team:

- Antonio Suárez, SASHE, CHFM, Director of Facilities Services
- Charles Brooks, Facilities Services Plant Manager
- Richard McKaskle, Lead Plant Operator
- Benjamin Burton, Facilities Services Supervisor

Overview

Midland Memorial Hospital is located in Midland, Texas. The main campus is 781,400 square feet with 474 licensed beds. When the director of facilities Antonio “Tony” Suárez came on board in 2010, Midland Memorial Hospital leadership was proud of the efficient building and having been good stewards. The hospital had recently completed a lighting retrofit project and received incentive dollars from local utilities. However, Suárez was somewhat alarmed on closer inspection. “The mechanical rooms had an abnormally high number of pumps. Perhaps we’re not as efficient as we think we are,” suggested Suárez. Benchmarking had not been implemented, therefore success was not measurable. Suárez and his team were determined to identify the actual reality and make gradual improvements.

The rude awakening equated to a 12 ENERGY STAR® rating. Suárez saw the opportunity in front of him. With inefficiencies come inefficient costs. Suárez knew he could generate cost savings while gaining recognition for the facilities service department: everyone wins.

In mid-July 2015, the American Society for Healthcare Engineering of the American Hospital Association (ASHE) recognized 23 medical facilities nationwide for significantly cutting energy consumption. Midland Memorial Hospital received this notable recognition. Each facility received an ASHE Energy to Care Award for its work to slash energy use, reduce operational costs, and free up more resources for patient care. This is Midland Memorial’s success story.

Objectives

Suárez set realistic goals. “We want to be at least average,” he told leadership and his team. They sought specific improvements:

1. Improve on operational efficiency and reduce utility expenses
2. Create a better business case for improvement using both energy and infrastructure considerations
3. Earn an ENERGY STAR rating of at least 50 by December 2015, with a long-term goal of 75 or greater
4. Gain recognition for facilities staff

Solutions

Suárez and his team decided to take the following actions:

1. Benchmark with the ENERGY STAR Portfolio Manager
2. Conduct an industrial audit to identify opportunities for improvements
3. Identify infrastructure improvement needs
4. Track future savings using the Portfolio Manager and a daily energy consumption dashboard
5. Identify and assign a champion that would take responsibility for the day-to-day monitoring required to be successful. For Midland Memorial, that champion was Richard McKaskle

To build the case to secure initial funding, Suárez highlighted the current abysmal ENERGY STAR rating in comparison to the industry, and submitted a request for proposal to conduct an industrial audit. This resulted in a consultant partnership with TME, LLC to create a strategic plan. The plan consisted of recommendations totaling approximately \$9.4 million (for both the main and west campuses) to generate an annual utility savings of \$1.5 million per year. Eleven potential energy cost-reduction measures were identified for Midland Memorial's main campus. Six were prioritized based on their projected return on investment that averaged 25.2 percent.

Suarez's team first focused on opportunities that simultaneously addressed infrastructure deficiencies and also provided energy efficiencies, rather than focusing strictly on energy efficiency alone. "I didn't present the projects strictly as energy conservation projects; rather, these were required infrastructure improvement projects. I'm competing with requests for new equipment for surgery, imaging, product lines...so I advised from an infrastructure prospective, 'we need this!'" He was also very conscious of being held accountable for his projects to save money.

Energy Measures Implemented

Midland Memorial implemented a series of energy and infrastructure improvement projects between 2010 and 2014 that dramatically improved the operation and efficiency of the facility and set them up to win a 2015 Energy to Care Award. Some of those measures included:

- Converting the chill water plant and distribution system from a constant volume/constant speed primary system to a variable volume/variable speed primary system using variable frequency drives (VFDs)
- Retro-commissioning air handling unit (AHU) heat wheels to capture waste heat
- Replacing many AHUs that were at end of life with fan wall technology
- Upgrading the building management system (the BMS, or control system) and implementing a series of retrocommissioning measures
- Performing steam trap testing and repairs
- Replacing surgical lights in surgery rooms with LED technology
- Upgrading chillers to include "free cooling" capability for low load conditions

- Establishing facility heating/cooling standards and setting thermostats with the correct heating/cooling deadband
- Optimizing air flows by reducing patient room air changes per hour from six down to four
- Installing condensing boilers that address an infrastructure deficiency of the heating

Energy Measure: A Closer Look

Operating room (OR) unoccupied setback is an energy measure that significantly reduces the number of air changes in the operating room during unoccupied periods while maintaining appropriate temperature and humidity controls. While occupied, the OR suite's HVAC system provides 20 or greater air exchanges per hour, which is automatically reduced to only 6 air exchanges per hour during unoccupied periods. This measure has the ability to save a tremendous amount of energy but can be difficult to get approved at a hospital. The primary challenge is the large group of stakeholders involved.

To overcome this challenge, Suárez and his team met with key stakeholders including leaders of support services, infection control, and operating rooms to discuss the significant energy savings potential and how they would mitigate any risks.

To minimize the concern of the OR staff, Suárez and his team initially installed a button that would immediately restore the room to occupied mode. Additionally, facilities documented air temperature and humidity every morning at 5 a.m.

As staff became more comfortable, the button was replaced with a dual technology occupancy device that used passive infrared and ultrasonic technology to ensure occupancy (even during periods of low motion).

Education

RAISE AWARENESS

The vice president of medical affairs distributed a letter to all of the physicians regarding temperature and humidity parameters. The letter educated staff to follow the guidelines.

ENERGY UNIVERSITY

Charles Brooks, Suárez's plant manager, attended a presentation from ASHE about Energy University (EU), a free e-learning database that offers guidance for achieving energy efficiency goals. Suárez now requires Brooks and his team of operators to demonstrate participation, completing at least one module monthly. The team members are required to show competency by passing the assessment test at the end of each module in the ASHE Technician Pathway of Energy University. This requirement helps continually reinforce the message of energy reduction as well as improve staff skill sets. As a result, the team hopes to raise the understanding level for a broader set of facilities employees who will be needed to sustain and improve the outcomes. (EU is also promoted to the maintenance and construction departments but is not required.)

COMMUNICATION

Every month, Suárez and his team share and evaluate data measured against respective goals. He shares similar information with his leadership monthly. As milestones are achieved, celebrations are planned. When the team hit the 50 ENERGY STAR rating in July of 2015, five months ahead of schedule, the team and leadership celebrated and recognized their accomplishments. Suárez believes that it is imperative that the goals and objectives of one's strategic energy plans and associated projects be effectively communicated to all levels of leadership (individually) prior to being presented to the funding approving body (or committee).

This allows for the business case to be understood and seen as a proposition that adds value to the organization financially while simultaneously improving the environment of care by all key members of the approving body.

Results

Midland Memorial invested in connecting electricity and gas information, in 15-minute intervals, into their building management system using the meter's pulse output. This real-time energy data allows them to regularly monitor money spent per day, in addition to any utility spikes. The consultant partnership also monitors savings opportunities monthly, which allows the hospital to clearly track results and effect on their facility.

Of the 11 potential cost-reduction projects that were identified for the main campus in the strategic plan, four were chosen and completed based on infrastructure need or operational impact. Those four projects had an approximate cost of \$1.6 million. Specific results included the following:

- The energy data reflects that after a full year of occupancy since the new 379,786 square foot patient tower opened on December 2013, the energy cost reduction measures and improved energy procurement cost resulted in a reduction of the total annual energy expense by \$361,917. In essence, the measures eliminated the energy expense of the new patient tower.
- For calendar year 2015, the Energy Star rating improved from 29 to 68, resulting in a savings of \$641,454 compared to the prior year. This represented an additional 20 percent reduction in the site EUI (kBtu/ft²). As a result, Midland Memorial has been awarded an Energy to Care Award for 2016 for the second year in a row.
- Unused meters were discovered during the benchmarking process; waste was eliminated.
- Midland Memorial won the Texas Association of Healthcare Facilities Management (TAHFM) "Energy Roundup" competition for the large hospital category in both 2014 and 2016. Midland Memorial came in at first place each year, demonstrating a reduction in energy consumption of more than 16 percent during 2013 and 18 percent in 2015.
- Leadership allotted Suárez's team substantial increases in capital funding toward energy and infrastructure improvements. By starting off small—\$500K with the initial project—and delivering, Suárez has earned additional funding each year.
- As of March 2016, Midland Memorial reached the Energy Star rating of 75 and has submitted their application to the EPA Energy Star program for official recognition as an Energy Star Hospital.
- Due to the 18 percent energy use reduction in 2015, Midland Memorial's Main Campus came in first place nationally in the EPA's Battle of the Buildings competition.

IMPACT FROM ENERGY TO CARE AWARD

Winning the Energy to Care Award has generated well-deserved recognition for Suárez, his team, and the organization. Suárez made it clear, "We want to be seen as a department that is adding value, optimizing the health care environment, and thereby positively impacting patient care." Ownership of this recognition of success was shared. Winning the award has created opportunities for Charles Brooks, the plant manager, and Richard McKaskle, the lead plant operator, to attend the national ASHE annual conferences, instilling greater motivation to perpetuate their success.

WHAT'S NEXT FOR MIDLAND MEMORIAL?

Suárez and his team know what needs to be done for their system to function more efficiently and Midland Memorial will continue to fund these projects over time, per the strategic plan. However, they admit they need to better address the behavioral portion of the equation, creating more awareness in all hospital departments. Efforts toward this include:

- Educating a larger audience. Trying to keep clinicians happy while staying within set standards (for temperature and humidity) established by the hospital.
- Maintaining senior leadership engagement.
- Creating a culture of ownership across the entire hospital to facilitate employees' behavioral traits beneficial to energy reduction initiatives.

In general, Suárez and his team plan to keep learning, keep improving, and keep celebrating the wins!

**The Energy to Care program, sponsored by Johnson Controls, encourages hospitals across the country to reduce their energy consumption by 10 percent or more over their baseline energy consumption. Since 2009, hospitals participating in the Energy to Care program have tracked more than \$67 million in energy savings. The free program includes a robust energy-benchmarking tool in addition to the awards. ASHE congratulates these hospitals for their leadership in reducing energy consumption.*



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**The American Society for Healthcare Engineering (ASHE)
of the American Hospital Association**

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The logo for Energy to Care features the words "energy to care" in a blue, sans-serif font. A blue plus sign is positioned above the word "care". To the right of the text is the tagline "Greater efficiency supports patient care." in an orange, italicized font.

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The logo for Sustainability Roadmap for Hospitals features a blue square with a white "H" inside, partially overlaid by a green leaf. To the right of the icon is the text "SUSTAINABILITY Roadmap for Hospitals" in a blue, sans-serif font. Below this is the tagline "A guide to achieving your sustainability goals" in a smaller, blue, sans-serif font.

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