CASE STUDY



SUSTAINABILITY WITHIN RURAL HOSPITALS

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Demographic Information

Mercy Hospital Lebanon

Mercy Hospital Lebanon is part of Mercy, an integrated non-profit health system with 35 inpatient hospitals, 11 specialty hospitals, and nearly 700 clinics in Missouri, Arkansas, Oklahoma, and Kansas. The rural two-county region where 85 percent of Mercy Lebanon's acute care patients reside has a population density of only 67 people per square mile (compared to Springfield, MO with 1,951/sq mi and St. Louis, Missouri with 5,157/sq mi) and a total population service area of 90,913 people in Laclede and Pulaski counties. Mercy Lebanon a 58-bed acute care, general medical/surgical facility completed in 1999. The 178,000 ft² hospital has a 24-hour physician staffed ER, conducts general surgery and outpatient procedures, and offers OB/GYN and clinic specialty services. The facility has 516 full-time employees and had 35,597 adjusted patient days in 2014. Insurance coverage for the region is approximately 66 percent private, 14 percent Medicare, 11 percent Medicaid and nine percent uninsured.



Executive Summary

Mercy Hospital Lebanon leaders and co-workers have worked to overcome challenges and implemented successful sustainability practices to reduce environmental impacts and reduce operational costs. Through a cost-effective retro-commissioning project focused on its heating, ventilation, and air conditioning (HVAC) system, the facility was able to reduce energy consumption by 23 percent, with savings totaling more than \$150,000 per year. The project not only reduced costs but also provided training for the facilities team on energy reduction strategies.

In 2011, the facility developed a Green Team and piloted a new "Sustainability Tool" to identify and prioritize ongoing opportunities while seeking resources for implementation. Several source reduction and recycling projects resulted from this initiative. In 2012, the hospital expanded its partnership with a local "sheltered workshop" (a facility that employs people with disabilities exclusively or primarily) to implement a single-stream recycling program which helped reduce the amount of landfill waste generated per patient by 20 percent, diverting an additional 30 tons from the landfill each year.

In August 2014, the team took on a new initiative called Green Departments. This do-ityourself sustainability program was designed to empower and engage co-workers to take the lead in being good stewards of their workplace resources, promote continuous improvement, and further engage leadership. To date, four departments have become "certified."



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Mercy Health Sustainability Program

Mercy hospitals have always had a commitment to improving environmental performance. This commitment was formalized with the development of a Sustainability program in 2012 in order to improve the ministry's ability to support and consolidate initiatives through their 46 hospitals and nearly 700 clinic and outpatient facilities.

The Challenge

Smaller rural hospitals are faced with many of the same challenges as larger urban hospitals (how to provide exceptional care while lowering operational costs); however, some challenges relating to environmental sustainability are unique to rural hospitals.

Several factors combine to make sustainability an even greater challenge for rural hospitals. Increasing energy costs creates pressure for facilities managers and leaders to be forward looking in their planning and investment around energy management. A lack of competition among vendors around waste management and recycling services means recycling is often unavailable or unaffordable relative to landfill trash (which is very inexpensive in the rural Midwest). Lastly, limited human resources to focus on sustainability initiatives and limited access to capital make investing in larger projects more difficult.

Mercy Lebanon was using excessive amounts of energy to maintain a comfortable environment for patients and co-workers. In 2011, the facility's energy consumption was 272 kBtu/ft² with an Energy Star performance rating of only 26. The national median in ENERGY STAR for this type of facility was 228 kBtu/ft². The facility leadership recognized an opportunity existed to try to reduce energy consumption and associated operational costs.

At the same time the facility was looking for ways to improve its recycling efforts and develop the team structure to improve its approach to sustainability initiatives and engagement of co-workers.

Rural communities often lack a competitive recycling market and the low cost to landfill garbage makes recycling relatively more expensive. This lack of access often leaves no affordable or viable options for recycling. The costs of each pickup are often prohibitively expensive (100-200 percent more than most urban locations), and fees are often extra due to a lack of competition and infrastructure. Oftentimes recycling doesn't pay off financially as it generally will within urban areas.

Since there are no full-time sustainability professionals at these facilities, programs must be developed that distribute responsibility while not significantly adding to already full workloads for co-workers.

The Strategy & Implementation

Energy–Benchmarks

In 2011, the Mercy Lebanon facilities team identified that its energy consumption was much higher than other similar sized hospitals, based on ENERGY STAR data. As a result, the team requested funding to perform an energy audit of the facility to identify opportunities for reducing energy consumption. In 2007, Mercy Hospital Ft. Scott, a sister hospital in Ft. Scott, Kansas, implemented an energy audit / retro-commissioning project that successfully reduced energy consumption by more than

Retro-commissioning Projects Implemented

- Eliminated simultaneous heating and cooling
- Converted surgery suites to occupied/unoccupied operation
- Converted select terminals to Variable Air Volume
- Implemented new airflow rates

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25 percent. The Mercy Lebanon team used the success of that hospital as an example of the potential savings to acquire the necessary funds to conduct the audit.

Similar to the Ft. Scott project, the audit results showed opportunities to reduce energy consumption by more than 20 percent. Given the estimated annual cost savings and an estimated payback of just one year, hospital leadership was very supportive. The hospital leadership team, facilities team, and contracted engineers from TME, Inc. then began reviewing the individual strategies and selected the projects with the greatest benefit and return on investment. Some available capital funds were diverted from other projects to allow for the team to begin implementation. The remaining funds needed to complete the projects were then budgeted for the next fiscal year.

In order to keep implementation costs low and ensure hospital facilities personnel were fully engaged in the process, the facilities director concluded, rather than just contracting the work, his team would be trained by the consulting engineers and implement some of the recommendations themselves. This strategy provided the facilities team with increased knowledge to not only implement the corrective actions, but ensure they could develop and implement preventative maintenance programs that would sustain the realized reductions over time. The team worked over the next several months to complete the implementation process. As a result,

the facility achieved a 23 percent reduction in energy and an annual savings of more than \$150,000.



The project earned an ASHRAE Technology Award for existing health care facilities.¹ The facility continues to identify and implement energy reduction strategies through its newly formed Green Team and initiatives.

Assessment–Green Team

In 2011, shortly after the preliminary energy audit, a Green Team was formed to identify and pursue further sustainability efforts using a newly developed "Sustainability Tool" to assist them in identifying, prioritizing, and implementing strategies. The tool was developed by Mercy coworkers and pollution prevention technical assistance specialists from Drury University. The Green Team was comprised of directors from Facilities, Environmental Services, Food Services, Surgery Services, Lab Services, and Materials Management. The first big initiative the Green Team spearheaded was the expansion of its recycling efforts.

Waste Reduction–Diversion

While there was a shortage of recycling companies servicing the Lebanon region, they had a preexisting relationship for recycling cardboard with a unique local partner. For nearly 10 years Mercy Lebanon had recycled corrugated cardboard with Laclede Industries, a local "sheltered workshop" that employs and provides benefits for adults with disabilities. In 2011, Laclede Industries expanded to include "single-stream" recycling of cardboard, office paper, aluminum, tin, and plastics (singlestream, also known as commingled, means all recyclables can be placed into the same container rather than segregating by type). Mercy Lebanon immediately began implementing the program at the hospital. Departments across the hospital were given recycling bins and were educated on the new program. Diversion rates steadily climbed and the culture of recycling gradually grew; within three years Mercy Lebanon had seen a 20 percent reduction in non-biohazardous landfill waste² per adjusted patient day. In 2012, the non-biohazardous landfill waste per adjusted patient day (APD) was 9.14. By 2013, that figure had dropped to 8.13 lbs., and by 2014 it was down to 7.35 lbs.—a 20 percent reduction in three years.

¹ A link to the case study developed by TME in 2013 is provided in the Resources section of this document.

² Non-biohazardous landfill waste is another name for municipal solid waste.

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This amounts to a marginal increase of around 30 tons being diverted from the landfills and into the recycling markets (Lebanon had 131 total tons of non-biohazardous landfill in 2014). Other projects implemented by the green team included lighting delamping projects to reduce energy consumption, and improved recycling of clinical devices through an offsite recycler/re-processor.

Engagement–Green Departments

In 2014, Mercy Lebanon was the first Mercy hospital to pilot implementation of a newly developed Mercy sustainability program called Green Departments. Modeled after Harvard University's "Green Offices" program, Mercy's Green Departments program engages and empowers co-workers to take the lead in greening their workspaces by providing co-workers with:

- A three-tier (Leaf One, Leaf Two, Leaf Three) "do-it-yourself" sustainability checklist covering energy, waste and recycling, innovation, best-practice sharing, and management opportunities;
- A Sustainability Wiki to drive information-sharing ownership and connectivity (a wiki is a website that allows *collaborative* editing of its content and structure by its users, e.g., Wikipedia), and



A platform for recognition, a sustainability-focused survey to gather information, integration of continuous improvement, "grassroots" recruitment and leadership component, and the sharing of case studies and stories.



Two Green Team members stepped up and became champions for the Green Departments program. They presented the idea to a meeting of vice presidents where the idea was embraced; each VP decided they would award the certificates to those departments that complete each checklist. Mercy Lebanon quickly became the most active Green Departments participant, and their co-workers' feedback has helped shape and form revisions and new components of the program.

The program is showing early success and the overall design seems to be working and progressing. Leaf One (completed first) and Leaf Two primarily are focused on actions that are internal to the department. Leaf Three is focused more externally on leadership, recruitment, and championing of other departments to participate and move onto new P R A C T I C E **Greenhealth**



levels. Leaf Three also focuses on story-telling, best practice sharing, and recognition of outstanding coworkers to expand the impacts onto a broader scale. The first "Leaf Three" department within Mercy occurred at Mercy Lebanon. This earliest of the early adopters has been passionately recruiting other departments across the hospital to join the Green Departments program.

All of these efforts are helping Mercy reduce operational costs and improve sustainability performance throughout the ministry. These programs and improved awareness within departments is spreading across the ministry into other hospitals and clinics. Each department, while operating in different hospitals in different communities, has a similar workflow and processes that make best practice sharing ideal across departments. These efforts are providing platforms to connect department champions and Green Teams across Mercy to share department-specific best practices.

Benefits

Between 2011 - 2014

- Mercy Hospital Lebanon reduced energy consumption by 23 percent from 2011 to 2013.
- 2. Reduced energy costs by more than \$150,000 per year.
- A Green Team was formed to help maintain progress, communicate with leadership, and push for continuous improvement.
- An expanded partnership was initiated with a local workshop to implement single-stream recycling in 2012, decreasing landfill waste by 20 percent while creating jobs for persons with disabilities.

5. Mercy Lebanon has increased its recycling by 30 tons per year.

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- The Green Departments program was piloted and launched in 2014, engaging and empowering co-workers to take ownership over the behavioral steps and education that improves energy management, recycling, and waste reduction.
- Four departments are engaged through Green Departments (in five months), raising awareness of best practices and expanding and diversifying network of environmental leaders across hospital.

Resources/Tools

- 1. EPA ENERGY STAR Program www.energystar.gov
- 2. Practice Greenhealth www.practicegreenhealth.org
- TME Inc. Retro-Commissioning case study at <u>www.tmecorp.com/portfolio/</u> <u>mercy-lebanon-retro-commissioning/</u>
- Harvard University Green Offices Program <u>www.green.harvard.edu/programs/</u> green-offices

For more information on Mercy Health's sustainability programs, contact Doug Neidigh at <u>douglas.</u> <u>neidigh@mercy.net</u>.



