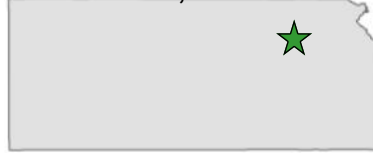


## 2011 Case Study

# Mercy Regional Health Center

Intern: Stephanie Lamb  
Major: Chemical Engineering  
School: Kansas State University

Manhattan, Kansas



### *Company background*

Mercy Regional Health Center (MRHC) is a private, not-for-profit organization formed in 1996 by combining Saint Mary Hospital and Memorial Hospital to become a 150-bed, acute-care facility. MRHC's purpose is to serve the local community by providing quality healthcare services. Throughout various locations in the Manhattan, Kan., area, MRHC employs more than 140 physicians and has more than 1,000 employees, while also having approximately 200 volunteers to serve Manhattan and surrounding areas with quality health and wellness services.

### *Project background*

Stephanie Lamb's internship consisted of energy efficiency, water conservation, and solid-waste reduction projects. These included boiler efficiency improvements, lighting retrofit and economic analysis for T8 linear fluorescent lamps throughout MRHC and metal halide lamps in the parking lot, restricting water flow on hand-washing sinks, water conservation kits for sterilizers, replacement sterilizers, blue wrap donation, and reusable to-go containers. This was the first time MRHC had participated in the Kansas State University intern program.

### *Incentives to change*

Over the past several years, MRHC had identified its need to care for the health of its community by taking steps to reduce its environmental impact. In addition to top management support, employees took an active role and asked MERCYCARES4EARTH members, the hospital green team, to implement recycling and energy conservation programs. These employees noticed lights were often left on in vacant areas and recyclables were put in with the trash. Like other industries, MRHC wanted to lower operating costs while reducing its environmental impact by conserving energy, waste, and water. MRHC acknowledged the need to educate employees to guarantee all were aware of and could assist in

MRHC's efforts to reduce its environmental impact.

### *Projects reviewed for E2/P2 potential*

#### 1. Boiler efficiency

The first project involved determining methods to improve efficiency of the existing boilers. The facility has three boilers that were manufactured in 1954. Due to the age of the boilers, it was determined that retrofits to improve boiler efficiency would not be cost effective. Instead, when boilers need to be replaced, condensing boilers that are up to 98% efficient should be purchased. These boilers improve efficiency by directing the exhaust pipe through the heat exchanger section of the boiler, allowing use of latent heat and reducing fuel requirements.

#### 2. Lighting

The second project involved reviewing two different lighting projects. The first involved re-lamping 32-watt, T8 linear fluorescents and Centium® ballasts throughout the facility with 25-watt lamps and Optanium® ballasts. The 25-watt, extra-long life lamps by Philips can replace 32-watt lamps with little to no noticeable light quality differences. These lamps extend the life of the lamp by 10,000 hours and reduce the power required by the ballast. There are 4,601, 32-watt 4-ft T8 lamps and 1,997 ballasts at the facility. The facility will see an estimated annual energy and cost savings of 569,865 kWh and \$45,589, respectively, if lamps and ballasts are replaced.

The second lighting project focused on finding a replacement for the existing 400-watt metal halide lamps in the parking lot fixtures. Research on retrofit options for the parking lot fixtures found Philips offers a 330-watt, AllStart metal halide lamp that increases the lumens and color rendering index from 24,000 to 26,400 lumens and 65 to 90, respectively. With its 45 fixtures, the facility will see an estimated annual energy and cost savings of 21,681 kWh and \$1,734.

### 3. Water conservation

Restricting water flow in hand-washing sinks from the current 2.2 gpm to 1.5 gpm or 1.0 gpm can be done safely by installing laminar flow devices or under-cabinet flow controls. By installing 1.0 gpm laminar flow devices, the facility will see an estimated annual water-use reduction and cost savings of 2,722,608 gallons and \$15,031.58. By installing 1.5 gpm laminar flow devices or under-cabinet flow controls, the facility will see an estimated annual water-use reduction and cost savings of 1,588,188 gallons and \$8,768.42.

A second water conservation project involved determining the impact of retrofitting old sterilizers with water conservation kits and replacing sterilizers. Water conservation kits reduce the water flow through idle sterilizers from 60 gallons per hour to 23 gallons per hour. A new sterilizer will reduce the water used by the unit from 224 gallons a cycle to 88 gallons/ a cycle. The recommendation for installing water conservation kits versus replacing sterilizers is based on the age and maintenance requirements of each unit. It was determined to install the water conservation kits on two units and replace three units. Water conservation kits offer an estimated annual water-use reduction and cost savings of 648,240 gallons and \$3,484. The replacement sterilizers would offer an estimated annual water-use reduction and cost savings of 3,144,480 gallons and \$17,363.

### 4. Solid waste

The surgical department uses blue wrap for sterile equipment, and the uncontaminated blue wrap is generally discarded. The intern was able to set up a donation system where Kansas State University Veterinary School will pick up non-contaminated blue wrap twice a week to use as animal-cage liners and other various uses. MRHC implemented the program during the internship and it is estimated this program will prevent 7,793 pounds of solid waste from the landfill each year at an annual savings of \$164.

The last project involved recommending use of reusable to-go containers in the cafeteria. Styrofoam to-go containers can be nearly eliminated by employees using reusable to-go containers. Interested employees could purchase two containers from the facility. The facility will exchange a dirty container for a clean container and offer employees a slight discount on their meals. By the employee purchasing containers and receiving a discount, this program can pay for itself and employees will save money in the long run. An annual solid-waste reduction and cost savings of 1,490 pounds and \$2,189 could result from this program being implemented.

### Summary of 2011 E2/P2 intern recommendations for Mercy Regional Health Center

Project description	Annual estimated environmental impact	Annual estimated cost savings	Status
Boiler efficiency improvements	Undetermined	Undetermined	Not recommended
Re-lamping linear fluorescents	569,865 kWh	\$45,589	Recommended
Re-lamping parking lot	21,681 kWh	\$1,734	Recommended
Hand-washing sinks			
Option 1: 1.5 gpm	1,588,188 gallons	\$8,768	Recommended
Option 2: 1.0 gpm	2,722,608 gallons	\$15,032	Recommended
Sterilizers— water conservation kits	648,240 gallons	\$3,438	Recommended
Sterilizers—replacements	3,144,480 gallons	\$17,363	Recommended
Blue wrap donation	7,793 pounds	\$164	Implemented
Reusable to-go containers	1,490pounds	\$2,189	Recommended
<b>Total savings</b>	<b>5,380,908 gal (option 1) 6,515,328gal (option 2), 591,546 kWh, 9,283.4 lbs solid waste</b>	<b>\$79,245 (option 1) \$85,509 (option 2)</b>	
<b>GHG reductions *</b>	<b>605.016 metric tons CO2e</b>		

\* only include conservative option 1 data for water conservation