

2016 Case Study

Via Christi Wichita, KS

Intern: Katherine Nguyen
Major: Biological Systems
Engineering
School: Kansas State University



Company background

What began as two separate Catholic congregations of sisters working toward excellence in the healthcare industry, blossomed into a successful union that is now Via Christi Health. As the largest healthcare provider in Kansas, Via Christi, while being well known for providing exceptional service to those in need, is continuously working toward achieving its goal of zero serious safety events by 2020. Having recently merged with Ascension, the world's largest Catholic health system, that goal is even closer to being met.

Project background

Since 2008, Via Christi Health has taken advantage of K-State's Pollution Prevention (P2) Intern Program in an effort to encourage sustainability practices. As the intern chosen for the summer of 2016, I conducted a brief follow up on waste segregation in the operating rooms (ORs), a project the previous intern had audited. However, I focused mainly on three projects that can potentially increase energy efficiency while reducing environmental impact – audits of (1) heating and cooling systems, (2) lighting, and (3) window heat gain. For each of the three, I planned to determine yearly cost and environmental impact, as well as conduct a literature review to determine the feasibility of replacing the product in question with a more energy-efficient technology.

Incentives to change

One of Via Christi's core values is reverence. Not only does this pertain to patients and associates, but to the environment as well. With the belief that God has lovingly provided humanity with limited physical resources, and mankind's duty as end users is to utilize them wisely, Via Christi is constantly looking for innovative ways to reduce its environmental impact.

Through its participation in K-State's P2 Intern Program, the health care provider's selected interns have the chance to investigate new solutions to the growing issues of utilitarianism.

Projects reviewed for P2 potential

OR waste segregation follow up: Prior to 2013, waste segregation within St. Francis was problematic and in need of intervention. A P2 intern, Tendai Kwaramba, performed a waste segregation audit for the surgery department in 2013. I conducted a follow-up audit of her project to see what progress had been made since then. I observed three surgeries in order to obtain information on current waste segregation habits of the surgical team.

Heating and cooling systems: Located in two separate mechanical rooms are three heat exchangers (HXs) in need of replacement, one for domestic hot water (DHW) and the other two for reheat. I researched the feasibility of replacing the HXs with heat-recovery chillers (HRCs) that provide chilled water while using the heat from the condenser for hot water applications. Due to time limitations, I was only able to provide full results for this project alone.

Lighting audit: St. Francis has been in the process of converting all current fluorescent lighting to light-emitting diodes (LEDs) in an attempt to provide more efficient lighting, while cutting the electricity bill and reducing the risk of mercury poisoning. To speed up the process, I conducted a feasibility study on updating the 2x4 fluorescent fixtures in all corridors, with the exception of the south tower and seventh floor, to LED fixtures. This project is still in progress.

Window heat-gain audit: St. Joseph utilizes a curtain-wall window system made of aluminum framing and insulating glass units. Because its windows are the main contributors to the building's surface area, I

performed calculations on the heat gain for the insulating glass units commonly found in patient rooms, not to include the heat transfer due to infiltration. The numbers I gathered can be used to assess whether or not window replacement is viable.

Summary of 2016 intern recommendations for Via Christi

Resource	Annual estimated environmental impact	Annual estimated cost savings	Status
Water	318,964,073 gallons	\$45,600.67	[Recommended]
Electricity	-1,233,504 kWh	-\$74,010.05	
Natural gas	363,586 therms	\$145,434.32	
Total savings*		\$117,024.94	
GHG reductions¹	1,749.87 metric tons CO ₂ e		

* Does not include projects that are “not recommended” or “further research is needed.”

¹ EPA P2 GHG calculator [Excel spreadsheet]. (2014). Environmental Protection Agency.