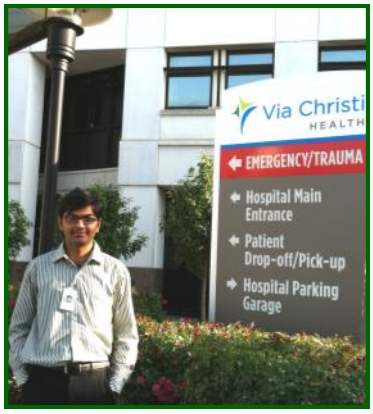
2011 Case Study

Via Christi Hospitals

Intern: Vishrut Patel
Major: Mechanical Engineering
School: Kansas State University

Wichita, Kansas



Company background
The Via Christi Health System has been serving the people of Kansas for more than 100 years. Today, Via Christi Health is the largest provider of health care services in Kansas. It serves Kansas and northeast Oklahoma through doctors, hospitals, senior villages, and health services. Via Christi Health employs more than 10,000 people throughout the organization.
The company has two large hospitals in Wichita, St. Francis on 929 N. St. Francis, which is larger than St. Joseph on 3600 E. Harry Street. Via Christi is well known for its sustainable practices. It had hosted pollution prevention interns for multiple summers, and the administration hopes to implement environment-friendly practices and technologies, especially for its facilities and HVAC operations.

Project background
The objective for the summer of 2011 was for the pollution prevention intern to work with the energy manager and facilities personnel to reduce peak demand for the St. Joseph and St. Francis hospitals, and explore new technologies for efficient HVAC and other operations. Intern Vishrut Patel worked with the building automation group to come up with optimum set points for the HVAC systems and data analysis for newer technologies like variable frequency drives, ice storage, etc. He worked on projects for more energy-efficient light retrofits and feasibility of occupancy sensors.

Incentives to change
Via Christi is an organization driven by its core values: human dignity, stewardship, and excellence. Stewardship means responsibly managing resources given to the facility. Via Christi's management and plant operations departments live the idea of stewardship every day. Considering their responsibility to manage electricity, water, gas, and other resources, they own the idea of energy conservation.
In addition, Anas Sadkhi, the energy manager overseeing both hospitals, constantly looks for ways to save energy and thus save money for the hospitals. He also aims to achieve the recently announced ISO 50001 standard for both facilities. The goal is to make the facilities more energy-efficient, using the ISO standard guidelines to maintain focus on the most important aspects of energy savings. Thus, the culture at Via Christi embraces new ideas towards energy efficiency, as well as management supporting the ideas with a focused vision.

Projects reviewed for E2/P2 potential
Patel reviewed a number of projects over the summer for energy efficiency and pollution prevention.

1. Chillers
Ice storage was an idea to use Via Christi's glycol chiller to produce ice during off-peak hours and use the ice during peak hours. Due to the smaller size of glycol chiller, this project was not recommended but advised for re-review when newer chillers were purchased.

Variable frequency drives (VFDs) for two back-up chillers at St. Francis hospitals were recommended. VFDs use the set of sensors in the chiller water system to control the power consumed by chillers. Estimated investments were more than $4 million and about six years of payback period.

Patel also worked on setting an optimum set point for chilled water. The higher the temperature of water coming out, the less the energy used by chillers. Considering the chillers are operating at 42°F and were designed at 45°F, there was room for improvement. Patel received and analyzed information about the non-standard part load value (NPLV) for chillers and estimated the savings if the chilled water set point was changed. Patel conducted a test with the temperature set point (successfully tested and set at 43°F) to see its effects on the hospital's internal and external customers as well as

its effect on energy conservation. Patel recommended monitoring the chilled-water valves for each air-handling unit at each degree of temperature increase to find the optimum set point for the systems. With a 1°F change (at 43°F), the hospital is estimated to annually save more than 100,000 kWh of energy and thus $7,000 of energy expenses.

2. Lighting
Patel recommended removing a total of 57 T8 light bulbs at the energy center of St. Francis, saving about 17,000 kWh and $1,200 annually. He recommended replacing the 400-W and 250-W metal halides with high-output T5 lights, saving about 39,000 kWh and $2,700 annually. Patel also recommended turning off lights in areas of less occupancy and conducted surveys for areas that potentially could use occupancy sensors. Patel recommended installing occupancy sensors in the medical records room, waiting areas, family rooms, and conference rooms, with an average of 0.25-years payback period on the investment.

3. Energy conservation opportunities
Patel also explored opportunities such as closing doors and openings to hospital areas that are air-conditioned. Patel's data collection on air-pressure demand and supply for the compressors at St. Francis hospital revealed that current compressors were efficient enough and replacing them with VFD-equipped compressors was not recommended.

Summary of 2011 H2E intern recommendations for Via Christi Hospitals

Project description	Annual estimated environmental impact	Annual estimated cost savings	Status
Increasing CHW supply temperature	280,857 kWh	$19,660	Recommended
Proximity sensors and push buttons for tunnel door	32,394 kWh	$2,267	Recommended
Replacing metal halides with T-5 bulbs	36,569 kWh	$2,560	Recommended
De-lamping redundant lights in energy center	16,977 kWh	$1,188	Recommended
VFDs on chillers	1,140,909 kWh	$79,864	Recommended
Occupancy sensors	123,294 kWh	$8,630	Recommended
Resetting sensor/timer for parking lots	12,118 kWh	$848	Recommended
Turning off lights–metal halides	12,264 kWh	$858	Recommended
Turning off lights– energy center, parts room	7,227 kWh	$506	Recommended
Turning off lights– energy center, generator room	22,566 kWh	$1,580	Recommended
Total savings *	**1,685,175 kWh**	**$117,961**	
GHG reductions *	**1,197 metric tons CO2e**		

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