

CASE STUDY



Water Reduction

Demographic Information:

Providence St. Peter Hospital, located in Olympia, Washington, is one of 32 facilities in the Providence Health and Services Catholic health care ministry. The 719,253 square foot non-profit Magnet hospital contains 390 beds. Since 1999, the sustainability focus at St. Peter has grown under the leadership of Geoffrey W. Glass, the director of Facility and Technology Services and Keith Edgerton, Providence Southwest Washington Region's sustainability coordinator. Stewardship is a core value for Providence Health and Services and St. Peter Hospital has earned Practice Greenhealth's Partner for Change with Distinction award since 2011.

The Problem

At the rate of a penny per gallon, water costs may seem nominal compared to other aspects of a hospital's budget. However, national utility rates have increased and will continue to increase, potentially creating strain for hospitals in the future. Since 1999, the cost of water has grown 10 percent every year and the cost of sewer has doubled. The speed of growth in utility costs presents an attractive economic cause for health care systems to focus on reduction programs.

Two-thirds of the cost of water is spent on treating potable water for domestic use. The majority of a hospital's water demand is for non-domestic water, or water used for heating and cooling instead of drinking or personal use. Potable water used in non-potable ways is an inefficient use of resources because treating water to make it safe to drink is very energy-intensive. Edgerton hopes that future utility providers will be able to widely supply buildings with two systems: a domestic system and non-domestic system to use with HVAC, toilets, and irrigation systems. Edgerton also hopes that future regulations will allow large facilities such as St. Peter to collect and store rooftop rain water for non-domestic use.

Executive Summary

As water scarcity and costs continue to grow across the country, every hospital has opportunities to locate projects that reduce water consumption and costs. Through a series of projects in the last 14 years, Providence St. Peter has decreased water consumption by 58 percent and saved \$2,510,479 on water. Sustainability leaders Geoffrey Glass and Keith Edgerton created a standard of high efficiency and performance that encourages employees to continuously seek out reduction ideas. By cycling savings back into the facilities department to promote green projects, Providence St. Peter has gained significant momentum in greening operations.

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"It has been a fun challenge to save water and still keep the campus looking beautiful with drought resistant native plants and flowers."

Jeremy Cline ,
Grounds Supervisor

"We found pride in working with staff, and to find fixtures that would work in their department and help conserve water."

Duke Johnson
Plumber, Stirrett-Johnson

St. Peter Hospital was using 62.2 million gallons of water a year in 1999 when Glass began to focus on water reduction programs as the director of Facility and Technology Services. Although water in Washington State is relatively plentiful and inexpensive, Glass strongly believes that not only do health care facilities have to be high performers at all times, they have to also be highly efficient with resources.

Strategy

Ideas for St. Peter's conservation projects come from incentive programs, third-party suppliers, other hospitals, and its internal staff. Project proposals are selected based on the likelihood to generate a quick return on investment (ROI). Using a team-based approach with clinicians as members is important for program success.

Utility providers in the state of Washington offer incentive programs with rebates to fund water reduction projects. Providence Health has taken advantage of about \$1 million in rebates to date. Suppliers, subcontractors, and engineers are

drawn to St. Peter's reputation for water reduction and regularly present the facility with new ideas. Glass also exchanges ideas with other Providence facilities and through Practice Greenhealth. Glass and Edgerton encourage employees to discover future projects and present proposals at team meetings. Once the precedent of quick ROIs from simple ideas was set, the in-house crew assumed additional sense of job satisfaction in taking ownership and investigating new water reduction projects.

The water decision-making process is centered on ROIs—budgeting officers look positively at proposals with 5-year ROIs and will at most consider projects with 12-year ROIs. Projects with an estimated ROI of under a year are the easiest to implement because they do not involve the following year's budget approval process. One such project with a ROI of less than one year was St. Peter's 2009 replacement of 700 plumbing fixtures. Although St. Peter likes to benchmark consumption with similar health facilities, Edgerton says St. Peter is also "not bashful on

being on the leading edge of never-before-seen, yet realistic, projects."

Clinicians who work in areas with proposed water projects are always included in planning to make sure projects do not increase infection risk or complicate clinical workflow. The infection control department is always involved on appropriate projects. Water engineers carefully consider Legionnaires disease as a serious risk in projects such as the switch to low-flow faucets and cooling tower upgradesⁱⁱ.

Implementation

Finding and fixing leaks was the first place St. Peter looked for water savings. Replacing single-pass refrigeration units, modifying an electric pump on a steam vacuum sterilizer, and turning off a condensate cooling line were some projects that had a ROI of less than two years. The latter project immediately saved 3.8 million gallons per year. The project was as effortless as determining that the effluent water temperature was below the 140-degree limit, calling the

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sterilizer vendor, and telling them to turn off the cooling pipe.

Water projects in clinical areas start as pilots for one or two months to promote buy-in, monitor the ease of use, and troubleshoot problems. For example, dual-flush toilets were installed in one patient room for nurses to provide input as everyday users before all 165 were installed. The operations and maintenance team also experimented with faucet speed for sinks in clinical areas. They found that 2.2 gallons per minute plugged the drain and 0.5 gallons per minute was too slow for hand-washing before

Single-pass refrigeration equipment replacement:

Costs: \$3,680

Savings: 328,000gal/year/unit

ROI: 1.1 years

settling at one gallon per minute. Adjusting the sink flow saves 10 gallons per day per faucet with a one-year ROI.

St. Peter is also working on changing its “golf course-like” landscape into a more natural one with native drought-resistant plants. Weather sensors that automatically shut sprinklers off and drip irrigation are expected to reduce irrigation runtime by 75 percent.

A rule of thumb at St. Peter is that all money saved from sustainability initiatives is cycled back into more green projects, creating a snow-ball effect of sustainable improvements.

Benefits:

Between 1998 and 2012, St. Peter’s water:

- 1) Consumption dropped by 58 percent from 62.6 million gallons to 29.9 million gallons per year.
- 2) Conservation programs had an ROI of 913 percent.
- 3) Programs saved \$2.5 million.
- 4) Related equipment last longer, translating to less maintenance and labor costs that rebate programs normally do not cover.

Challenges and Lessons Learned

Edgerton has found although training staff on how to save water is not technically complicated, checking in and reinforcing processes with each department at least once a year is necessary to ensure new habits are retained over time. Always evaluating St. Peter’s infrastructure while keeping up with new technology can sometimes be a challenge. For example, 1.1/1.6 gallon dual-flush toilets St. Peter installed in 2009 are already considered to be less efficient compared to new 1.28 gallon toilets.

Edgerton believes that St. Peter has room to do more marketing about its sustainability programs. By leveraging the good relationship his department has with public relations, he thinks citizens in the Puget Sound region are highly environmentally conscious and would enjoy learning about St. Peter’s

stewardship values and favor the hospital as a health provider.

Any facility, especially an older facility, has opportunity for water reduction. Even newly constructed facilities that already have efficiency features such as low-flow toilets and showers still have opportunities that may be harder to find. According to Edgerton, a facility that has yet to examine water consumption in gallons per square feet has the most opportunity for guaranteed savings that cost nothing to implement. Tackling overwatering is one project example that is easy to start and finish without feeling overwhelmed and can create a water-savings momentum.

Endnotes

- i. How healthcare uses water. (2013). Retrieved August 13, 2013, from <https://practicegreenhealth.org/topics/energy-water-and-climate/water>
- ii. Legionella risk assessments. (2013). Retrieved August 13, 2013, from <http://healthybuildings.com/water/legionella-risk-assessments>