



2013

70 percent

of member hospitals
have an EPP policy

\$30 million

in five-year energy cost-
savings from Award winners

SUSTAINABILITY BENCHMARK REPORT

A Practice Greenhealth Member Benefit

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EXECUTIVE SUMMARY

With the growing pressure of health care reform and the implementation of the Affordable Care Act, hospitals have a critical need to identify cost-savings and efficiencies in light of shifting reimbursement models. Beyond its core alignment with human health, environmental sustainability can offer considerable value to the cost-savings conversation. Practice Greenhealth's award-winning hospitals saved \$10 million in avoided solid waste disposal costs, another \$15 million in avoided hazardous waste disposal fees, and more than \$1.3 million savings in water use. At a time when health care executives are turning over every rock in pursuit of new efficiencies, understanding how your institution performs next to its peers and zeroing in on remaining areas of opportunity is critical. This report will assist hospitals in conducting that gap analysis, by providing comprehensive data on the environmental progress of health care facilities across the sector for comparison.

Award winners reported annual savings of over \$30 million last year, from a total of nearly 500 energy projects implemented over the last five years. On average, these projects saved hospitals five percent of their total energy costs—actual savings ranged from smaller to much larger. Last year, these projects prevented the consumption of over 533 million kBtus of energy, with more than 1.8 billion kBtus avoided over the past five years. The avoided energy use totals more than \$1 billion in avoided costs over the last five years—from less than 200 hospitals. And this data was conservative, given that Practice Greenhealth limited data entry to just five energy reduction projects per hospital. The cost reduction implications for engaging just 25 percent of the U.S. hospital market in this kind of energy reduction work could free up billions in financial resources. And Practice Greenhealth is committed to working alongside its members to make those energy saving and programs a reality.

This year's Sustainability Benchmark Report demonstrates that a core group of U.S. hospitals are continuing to make progress on the sustainability front and are taking their sustainability management, tracking and metrics development processes to a new level. Practice Greenhealth is excited to play an important role in this ongoing transition by providing the country's only comprehensive data set on sustainability innovation in health care. As always, we look forward to our members' feedback and any suggestions that can strengthen this report in future years.

SAVINGS REPORTED

Savings From:	Amount of Waste Prevented	Dollars Saved	Table in Report
Energy	533 million kBtu	\$30.3 million	Table 56
Recycling (avoided solid and universal waste)	94,930 tons	\$25.5 million	Text, Section IV. Waste Profiling
SUD Reprocessing	680 tons	\$3.1 million	Table 21
Water	209 million gallons	\$20.5 million	Table 60
Solvent Distillation	34,000 gallons	\$740,625	Table 31
Reusable Sharps Container Programs	2,065 tons	\$687,900	Table 22
TOTAL		\$6,162,522	Table 62



1.0 INTRODUCTION

**Cleveland Clinic
Independence Family Health Center**

1.0 INTRODUCTION

Practice Greenhealth is proud to present its **fifth annual Sustainability Benchmark Report**, highlighting the achievements of its 2013 Award-winning facilities. The report presents a summary of useful benchmarking information for hospitals' environmental programs from data collected in 2012, such as average waste profiles, environmentally preferable purchasing data, and energy and water consumption. Numerous tables of data present which specific activities Award winners have implemented over the course of their sustainability journeys. This report can be used to answer detailed questions such as "What percent of the data set have *full-time* sustainability officers?"; "What reusable items are Award winners purchasing for use in the OR?"; or even, "How much money per staffed bed are hospitals saving from implementing single-use device (SUD) reprocessing?"

Energy consumption data and energy efficiency project savings are presented in detail. Because energy use varies greatly by where a hospital is located (Chicago versus Tampa), the hospital data set has been analyzed by climate zone as defined by CBECS (Commercial Building Energy Consumption Survey). These zones are determined by heating- and cooling-degree days per year (similar to the concept of planting zones that run horizontally across the U.S. (see Figure 10). The use of this normalizing data allows a meaningful comparison of energy consumption and expenditures across the United States.

The 2013 Sustainability Benchmark Report includes activities reported by 198 winners of the **Partner for Change (PFC)**, **Partner for Change with Distinction (DIST)** and **Environmental Leadership Circle (ELC) Awards** won in Practice Greenhealth's 2013 Environmental Excellence Awards Program. These and other Awards were presented to 330 recipients at CleanMed 2013 in Boston, Massachusetts.

New this year, data has been analyzed and presented as a whole for the data set, but is also presented by size of facility—as determined by square footage. In addition, each table has a blank column for members wishing to enter their own data into the tables for comparison. The tables have been shortened and streamlined this year to aid in the "digestibility" of the report. Data was selected for inclusion based on Practice Greenhealth's understanding of which data points are of primary interest to members. If, however, there is a specific data point from the Partner for Change Award application that is of interest and has not been reported, please contact your Practice Greenhealth Liaison or Lin Hill, Director of Awards, for additional information (lhill@practicegreenhealth.org).

The data herein has been reviewed and presented by a statistical firm using the Statistical Package for the Social Science (SPSS) for increased validation of the data. Regression analysis was used by the statistical team to analyze the data. The data set is larger than that presented in last year's report, which included 171 winners.

We hope that you will take time to review the new data set and identify useful benchmarks for your facility. Further, we hope that your facility will participate in Practice Greenhealth's 2014 Awards program—which includes an updated set of normalizing data, and places a new emphasis on the metrics of sustainability performance. Awards will be presented at CleanMed 2014 in Cleveland, Ohio in early June of 2014.

Most importantly, a special thanks to all of the hospitals that submitted Award applications in the 2013 Awards season. Practice Greenhealth could not share this important data without the many hours our members spent preparing their Partner for Change Award applications. We are pleased to give back to our community with this report.



2.0 THE DATA SET

Homestead Hospital
Baptist Health South Florida

2.0 THE DATA SET

The 2013 data set includes **198 facilities** that submitted the 2013 Partner for Change Award application and won Partner for Change, Partner for Change with Distinction or Environmental Leadership Circle Awards. This data includes 198 hospitals (all have overnight beds and operating rooms) and five large clinics that have operating rooms. For simplicity, all facilities are referred to as “hospitals” in this report. In response to members’ requests to be able to compare their data to similar hospitals, the data is presented in the tables below as a whole, but has also been broken up into cohorts of smaller and larger hospitals, based on size. Hospitals with **less than 500,000 square feet** are grouped in the “**smaller hospitals**” data sub-set and hospitals with 500,000 square feet or more comprise the “**larger hospitals**” data sub-set. This separation maintains a statistically significant number of members in each group for analysis. Both of these sub-sets and the 11 hospitals that did not report square footage were included in the “**all 2013 hospitals**” data set. The **average smaller hospital** has **136 beds** (the mean), while the **average larger hospital** has **410 beds**. Ninety-four percent of the hospitals in the data set are not-for-profit.

Practice Greenhealth uses a range of normalizing factors to allow for better comparison between diverse kinds of hospitals. The hospitals analyzed in this data set range from less than ten staffed beds to over 1,500, from small critical access hospitals (CAHs) to large, academic medical centers that treat the country’s sickest patients, and from incredibly rural locations to the hearts of our major cities. Practice Greenhealth continuously reviews the data set for opportunities to draw new inferences based on these different cohorts of hospitals. Work underway for 2014 includes a new analysis of how patient acuity and average length of stay may factor into environmental program data. Data set averages for these normalization factors used in 2013 are presented in Table 1 below; these factors are defined in **3.0 Normalization of Data**.

The Data Set

TABLE 1: THE DATA SET

PFC Applicants Represented by Type of Facility:	Sample Size
Smaller Hospitals (<500,000 square feet)	84
Larger Hospitals (≥500,000 square feet)	103
Hospitals that did not supply square feet	11
Total Hospitals Used in the Data Set ¹	198
1) Note that averaged numbers reported below reflect the average of answers reported by the applicants, but not every applicant answered every question, so N<198 in most cases.	
Average Data Set Characteristics	
Square Footage	187
Staffed Beds	183
Adjusted Patient Days	169
Patient Days	152
Licensed Beds	192

PFC Applicants Represented by Type of Facility:	Sample Size
Full-time Equivalent Employees	198
Operating Rooms	197
OR Procedures	187
ER Visits	182
Outpatient Visits	190

How to Interpret the Data Tables

The data is presented as follows: most tables have four colored column headers: the first (darker shading) data column shows an average (or mean) value for all 198 hospital winners, the second column (lightest shading) shows data for the 84 hospitals with **less than 500,000 square feet**, and the third column shows data for the 103 hospitals with square footage **greater than or equal to 500,000 square feet**. New this year, a fourth blank column has been added for your convenience to enter your hospital's data. The **rows** of data are generally presented from **highest to lowest occurrence** based on **all 2013 hospitals** data, thus, sustainable activities presented in the first row were implemented by more hospitals than activities presented in the last row. For normalized data, the rows are presented starting with the highest correlating variable.

SAMPLE TABLE

Sustainable Activities	All 2013 Hospitals	Smaller Hospitals (<500,000 square feet)	Larger Hospitals (≥500,000 square feet)	Your Data
Activity 1	95%	90%	94%	
Activity 2	76%	71%	80%	
Activity 3	45%	47%	42%	

How to Interpret the Figures

The data is presented using box plots that provide a visual representation of three groups of data. The **white box** represents the entire data set of all **198 hospitals**; the **blue box** represents the subset of **smaller hospitals** and the **orange box** represents the subset of the **larger hospitals**.

The **box** of each graph represents the core data (the middle 50 percent) for each set, i.e., the **bottom** of each box marks the **25th percentile** of the data and the **top** of the box marks the **75th percentile**. The **middle line** represents the **average** or **mean** of the data.

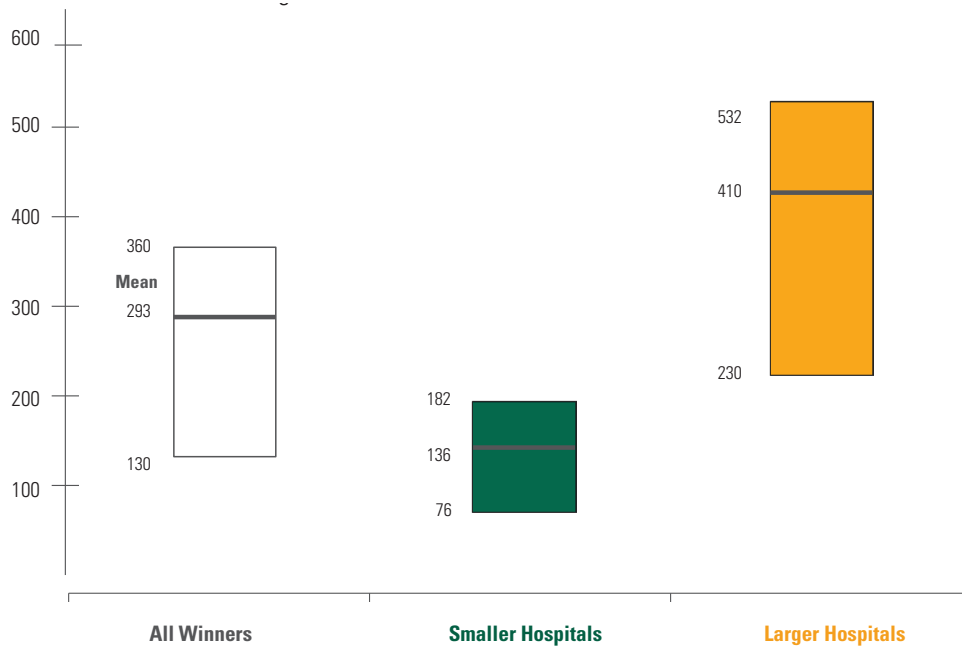
To illustrate, Figure 1 presents the distribution of staffed beds in the data set; the **white box** represents all the hospitals and the horizontal percentile lines are as follows:

- The top of the box = 75th percentile = 360 beds
- The horizontal line = the mean, or average = 293 beds
- The bottom of the box = 25th percentile = 130 beds

The blue and orange boxes for smaller and larger hospital subsets are interpreted in the same manner. Remember that the boxes represent the core 50 percent of the data set—there are higher and lower data points

that are not represented for simplicity's sake. (For example, 25 percent of the larger hospitals (orange box) have more than 532 beds, and 25 percent have less than 230 beds. Similarly, 25 percent of the smaller hospitals (blue box) have more than 182 beds and 25 percent have fewer than 76 beds). The boxes represent the "heart" or bulk of the data set. The **average smaller hospital** has **136 beds** (the mean), while the **average larger hospital** has **410 beds**.

FIGURE 1: DISTRIBUTION OF STAFFED BEDS IN DATA SET





3.0 NORMALIZATION OF DATA

Providence Newberg Medical Center
Providence Health & Services in Oregon

3.0 NORMALIZATION OF DATA

In order to effectively compare data between hospitals, or even to compare one hospital's data from year to year, most data must be **normalized**. The idea is to determine how **characteristics** that one is interested in (e.g., waste generation, energy consumption or water use) are **affected** by certain variables (e.g., patient days, staffed beds, number of operating rooms, or square footage). **Normalizing** the data allows one to **look at each variable** (such as patient days) that may affect the characteristic of interest (waste generation) individually, while **holding the other variables constant** (beds, number of operating rooms and square feet). This technique allows removal of other influences from the analysis and a focus on the chosen variable. These **variables** are referred to as **normalizing factors** in this report.

Each year, Practice Greenhealth conducts a search for the best normalization factors using multiple regression techniques. These techniques identify which normalizing factors correlate best with the characteristic of interest—providing a clearer picture of which factors most strongly affect the data. Some of the normalization factors correlate well with the data and some do not, because some variables affect the characteristics we are interested in more than others (e.g., the number of staffed beds more strongly influences waste generation than the number of outpatient visits). Regression techniques identify which variables are considered the best “predictors” for a given characteristic. For example, it was determined that patient days was the best normalization factor, or predictor, of total waste generation, with an R2 value of 0.857, which is very good (1.0 would be a perfect correlation). This means that **patient days can explain 86 percent of the variation in waste generated**.

Presentation of Data

Normalized data (such as pounds per patient day) is generally presented in the tables in order of decreasing correlation; the best normalization factor or predictor (e.g., patient days for waste generation) is presented first, followed by the next best predictor, (such as staffed beds).

In the past, Practice Greenhealth has utilized **adjusted patient days (APD)** as a “favored” normalization factor, because it reflects both inpatient and outpatient activity. However with refined analysis of the data this year, adjusted patient day was generally not the normalizing factor that best correlated with the data—in other words, holding other factors constant, variations in the data could not be best explained by APD. The regression analysis this year showed that other factors correlated with, or predicted, the characteristics of interest (waste, energy, water) better than APD. A mix of **patient days, number of ORs, and staffed beds** were the **best predictors of waste generation and water use** while **square footage** was the **best predictor of energy consumption**. The data indicate that outpatient visits had one of the **lowest correlations**, or was not a strong predictor, of waste generation. Although outpatient care is an increasing part of a hospital's operations, it does not appear to factor strongly into the total amount of waste generated.

The **tables and figures** below report the normalization factors that best correlate with (or explain variation in) the data presented. Also of note, there are a number of **tables** within this report that present “**percent of the data set.**” This data indicates what percent of the data set has implemented a specific greening activity; for example, the percentage of applicants answering “yes” to “Does your facility complete a community benefit report?” This type of comparison does not require normalization. In addition, a number of **figures** present **average waste profiles** for the data set, and **do not require normalization**.

Normalization Factors

The bulleted list below includes the **ten normalization factors** considered in the regression analysis used to interpret the data presented in this report. **Table 2** presents average values for each factor. It should be mentioned that the appropriate normalization factor should be selected based on three considerations—**meaningfulness, comparability, and availability**. Practice Greenhealth has used factors that are commonly used and readily available in the industry.

Normalization Factors

- **Adjusted patient days:** Adjusted patient days (APD) take into account inpatient and outpatient activity and are generally calculated as:
$$\text{APD} = (\text{Total patient days}) * (\text{Total patient revenue} / \text{inpatient revenue});$$

where total patient revenue = inpatient + outpatient revenue.
- **Patient days:** A patient day is the unit of measure denoting lodging provided and services rendered to inpatients between the census taking hours (usually at midnight) of two successive days¹.
- **Staffed beds:** Staffed beds are those in-service and patient-ready for more than half of the days in the reporting period. Staffed beds does not include beds ordinarily occupied for less than 24 hours, such as those in the emergency department, clinic, labor (birthing) rooms, surgery and recovery rooms and outpatient holding beds.
- **Employees:** Practice Greenhealth uses the term “*full-time equivalents*” or “*FTEs*” in the report to designate the number of staff at a facility².
- **Outpatient visits:** The total number of outpatient visits reported during the reporting period, including emergency room visits, ambulatory surgery visits, observation visits, home health visits and all other visits. However, this number did not present as a good indicator.
- **Operating rooms:** The number of operating rooms at a facility is a relatively easy variable to account for, and does not typically change throughout the year.
- **OR procedures:** The number of OR procedures indicates how busy a facility’s ORs were over a given year.
- **Number of ER visits:** The total number of patients seen in an emergency unit who were not later admitted as inpatients. However, this number did not present as a good indicator.
- **Square footage:** Square footage provides data on how large a facility is and can be an excellent normalization factor when looking at energy data and cost. Square footage also indirectly takes into account both inpatient and outpatient activity.
- **University or research facility:** New this year, the data was tested to determine if being a university or having associated research facilities affected environmental performance. No significant correlation was observed.

¹ Oregon Association of Hospitals and Health Systems. Hospital Financial Terminology. 2009. Available at: <http://www.oahhs.org/data/hospital-financial.html>.

² One important aspect to consider when using the normalization factor of FTEs is how organizations are counting FTEs. Are contracted staff such as environmental services, food services or nurses considered in the FTE numbers? How are physicians or medical residents quantified? Conversations with member hospitals lead us to believe there may be some significant variation in how this number is being calculated. The idea is to capture the number of people routinely onsite every day (other than patients and visitors). Practice Greenhealth is revisiting how to define this term appropriately for data collection in the 2013 awards period.

TABLE 2: AVERAGE NORMALIZATION FACTORS

Normalizing Factor	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Square Footage	855,971	292,052	1,315,867	
Staffed Beds	293	136	410	
Adjusted Patient Days	135,131	68,168	187,295	
Patient Days	77,193	31,536	105,584	
Licensed Beds	333	163	461	
FTE	2,928	869	4,358	
Operating Rooms	15	8	21	
OR Procedures	11,789	6,573	16,178	
ER Visits	47,187	34,328	56,998	
Outpatient Visits	304,375	114,869	411,262	





Magee-
Womens
Hospital

4.0 RESULTS

4.0 RESULTS



I. SUSTAINABILITY AND ENVIRONMENTAL INFRASTRUCTURE

As sustainability has become a mainstream focus within the health care sector, it is increasingly clear from the data that a critical aspect in successfully integrating sustainability into a hospital's core functions requires an engaged executive team and a strong sustainability infrastructure. **Table 3** identifies key indicators of a sound environmental infrastructure, indicating **almost all hospital winners (95 percent) shared sustainable activities with their senior leadership team or board of directors**. Additional data indicates:

- 76 percent of the hospitals have **developed a strategic plan** around sustainability that includes goals
- 74 percent have **calculated a payback period** for requested capital for sustainability projects
- 70 percent have a **full-time sustainability officer**

Surprisingly, the data indicates that smaller hospitals are actually more likely to have a **full-time sustainability officer** than larger hospitals—75 percent of smaller hospitals reported having a full-time sustainability officer, as compared to 64 percent in larger hospitals. Given that smaller hospitals often have fewer financial resources available to hire additional staff than their larger peers, this particular data point may be misleading. One possibility is that smaller hospitals may have responded they had access to a full-time sustainability officer, but this person is seated at the health system—rather than individual hospital—level. Another possibility is that hospitals responded they had a full-time sustainability role—despite this person having significant other responsibilities at the hospital, such as facilities management, environmental services or environmental health and safety compliance. Practice Greenhealth has repeatedly found through its work with member hospitals that larger institutions are better positioned to advocate for the creation of this position, given the increased return on investment at larger sites.



TABLE 3: SUSTAINABILITY INFRASTRUCTURE AND ACTIVITIES

Sustainability Infrastructure	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Shared sustainable activities with senior leadership team and/or addressed board of directors	95%	95%	94%	
Developed strategic plan around sustainability that identifies short-, medium- and long-term goals	76%	62%	66%	
Calculated payback period for sustainability activities that have up-front costs	74%	68%	79%	
Have a full-time sustainability officer	70%	75%	64%	
Owners, shareholders or board has been presented with information on potential or actual return on investment (ROI) for sustainability projects	64%	63%	65%	
Have an overall environmental policy that guides sustainability efforts	62%	57%	62%	
Added sustainability measures for leadership team into performance evaluations	43%	42%	42%	
Added language to job descriptions on commitment to the environment and the role that each employee plays	33%	30%	36%	
Track environmental improvement initiatives in the Joint Commission structure	34%	30%	37%	

Who’s Who in Health Care Sustainability

Green teams remain an important mechanism for implementing projects and incorporating sustainability into hospitals, with **99 percent** of 2013 hospitals indicating they had **green teams** or a similar committee in place. **Table 4** depicts the distribution of green team members by department, in order of decreasing frequency. Larger hospitals were more likely to include staff from food services, engineering, and safety on their teams, and were more likely to have a physician on their team. In addition, larger hospitals were more likely to have environmental health & safety (EH&S) members on their team, likely a reflection of additional staffing in this area at larger sites. All hospital winners, however, showed diversity in their green teams—good evidence of how multidisciplinary sustainability programs can be.

TABLE 4: DEPARTMENTAL REPRESENTATION ON GREEN TEAMS

Department	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Environmental Services	96%	95%	97%	
Facilities	95%	92%	97%	
Nursing	91%	93%	89%	
Materials Management	91%	92%	92%	
Food Services	89%	81%	96%	
Administration	86%	83%	89%	
Engineering	82%	77%	87%	
Safety	80%	74%	85%	
Nutrition	80%	75%	85%	
Communications/Marketing	77%	76%	79%	
EH&S	64%	50%	74%	
Infection Control and Prevention	50%	44%	51%	
Physicians	48%	39%	52%	
Risk Management	27%	20%	29%	





II. A CULTURE OF SUSTAINABILITY

Hospitals are often leaders in their local communities and make an important contribution to community health—outside of their four walls. As health care institutions think more critically about how their decisions about products, processes, materials and equipment can impact not only patients and staff, but also the surrounding community, new synergies are emerging with hospitals’ **community benefit programs**. While community benefit reporting has become a staple in most health care institutions, its integration with sustainability work is still innovative. Learn more about how hospitals are tying this work to community benefit reporting in the Catholic Health Association’s [Guidelines for Reporting Environmental Improvement Activities as Community Benefit and Community Building to the Internal Revenue Service](#).

Community Benefit Reporting and Needs Assessment

A growing number of Practice Greenhealth Award winners are thinking strategically about how sustainability activities support other important goals, such as community health and wellness. The vast majority of winners prepared a community benefit report (**Table 5**).

- 76 percent **included sustainability activities** in their community benefit reports
- 54 percent conducted a **community needs assessment** and around half of **those identified sustainability activities** that help meet the needs identified in the assessment

TABLE 5: COMMUNITY BENEFIT REPORTING

Community Benefits and Needs	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Facilities that prepare a community benefit report	91%	92%	91%	
Included sustainability activities in their community benefit report	76%	74%	75%	
Conducted a community needs assessment	54%	58%	52%	
Identified sustainability activities that help meet the needs identified in the community needs assessment performed	49%	49%	50%	

Data presented in **Table 6** indicates using **local media** to communicate sustainability activities and **interacting with local businesses, schools and community groups** were the most frequent mechanisms for interacting or sharing knowledge on sustainability. Smaller hospitals reported slightly more activity with their local communities, while larger facilities were more likely to develop a sustainability presence on their websites.

TABLE 6: LEADERSHIP WITHIN THE LOCAL COMMUNITY

Leadership Within the Local Community	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Used local media to communicate sustainability activities to the community	68%	70%	66%	
Shared information on sustainability programs with local businesses, community groups, schools, etc.	66%	69%	62%	
Educated community on environmental topics (e.g., provide information on proper medication disposal when issuing prescriptions)	64%	63%	63%	
Met with city government reps or local organizations to promote sustainability locally or plan local events (like clean air days)	59%	66%	53%	
Developed a sustainability webpage for the public on facility website	52%	39%	60%	
Included sustainability in advertising campaigns	37%	38%	37%	





III. WASTE PROFILING

Waste Data

Practice Greenhealth recommends comprehensive waste tracking data as a starting point for any health care institution looking to **improve its environmental footprint**. Understanding the breakdown of both **cost** and **weight** for different waste categories can be one of the easiest strategies to identify areas of opportunity and low-hanging fruit. Average waste data as a percent of total waste stream is presented in **Table 7**. The average **recycling rate** for all winners was slightly over **30 percent**, with a combined savings of over **\$25 million in avoided waste disposal costs** for Award-winning hospitals. **Top performing hospitals** (an average of the top 10 percent of those hospitals generating the least RMW and recycling the most) did even better.

- **Top performers** averaged **56 percent recycling** compared to all hospitals with 31 percent
- **Top performers** averaged **2.3 percent RMW** generation compared to an average of 9 percent

The data presented in **Table 7** indicates:

- **Average of all hospitals** exhibited approximately **60 percent solid waste generation** as a percent of total waste stream
- **Smaller hospitals** had **slightly higher** recycling rates
- **Larger hospitals** generated a **higher percent of regulated medical waste** and exhibited slightly **higher hazardous waste** generation rates

TABLE 7: AVERAGE WASTE PROFILE (AS PERCENT OF TOTAL WASTE STREAM)

Waste Type	Average % of Total Waste Stream			
	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Solid ¹	59%	60%	59%	
Recycling ²	31%	33%	30%	
RMW	9%	7%	10%	
Hazardous ³	1%	<1%	1%	

1) Some of the solid waste numbers from facilities that treat RMW onsite may inadvertently contain treated RMW (e.g. RMW treated onsite by autoclave before being landfilled), which drives the solid waste percentages up and the RMW percentages down.

2) Recycling includes only recycling as defined in Appendix A of the Partner for Change Award application. Practice Greenhealth uses a methodology that differentiates between waste diversion and reuse, and formal recycling programs. No waste diversion is included in recycling totals.

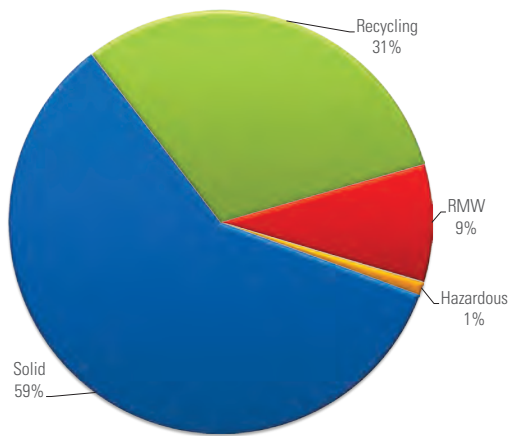
3) The hazardous waste percentages were generally reported as less than one percent, but this number should not be zero for any hospital. This number may actually increase at a facility as their awareness for identifying and properly handling RCRA hazardous pharmaceutical waste increases.

TABLE 8. WASTE GENERATION AND COST AS A PERCENT OF TOTAL

Waste Type	Waste generation as % of total	Waste costs as % of total	Your Waste Generation Data	Your Waste Cost Data
Solid ¹	59%	36%		
Recycling ²	31%	15%		
RMW	9%	37%		
Hazardous ³	1%	12%		
Total	100	100		

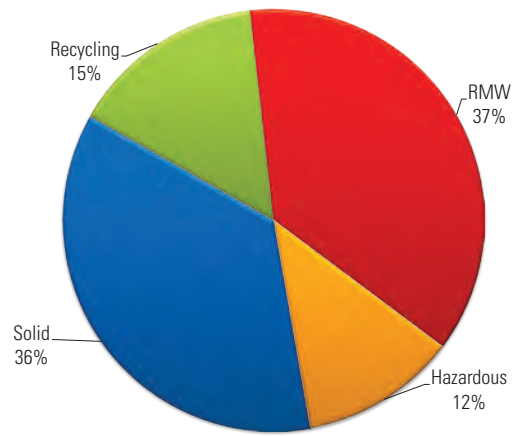
The **average waste generation** profile is illustrated in **Figure 2** and **average waste cost profile** is illustrated in **Figure 3**. Comparing these pie charts, not surprisingly, **RMW and hazardous waste treatment and disposal costs are disproportionately large** (Figure 3) compared to their percent of waste stream (Figure 2). In fact, while RMW and hazardous waste tonnage add up to just **10 percent of the average waste stream**, they represent nearly **50 percent of treatment and disposal costs**. Practice Greenhealth encourages its members to focus on reducing RMW and hazardous waste streams where possible to not only reduce waste, but to also avoid treatment and disposal costs and environmental impacts.

FIGURE 2: AVERAGE WASTE PROFILE



*Among hospitals reporting all four types of waste

FIGURE 3: AVERAGE WASTE COST PROFILE



*Among hospitals reporting all four types of waste cost

Normalized Waste Generation

Different hospitals and health systems analyze their data using a variety of metrics. In this section, the best waste predictors, or the factors that had the **highest correlation** with waste generation were **patient days** (presented in **Table 9**) and **staffed beds** (presented in **Table 10**). Because a number of member hospitals use adjusted patient day (**APD**), we have presented that data in **Table 11**, while recognizing that APD was not the best predictor of waste generation. Top performers for recycling and RMW generation:

TABLE 9: AVERAGE ANNUAL WASTE GENERATION NORMALIZED BY PATIENT DAYS

Waste Type	Total	Smaller Hospitals	Larger Hospitals	Your Data
Solid Waste ¹ (pounds/patient days)	27.0	30.2	25.2	
Recycling ² (pounds/patient days)	13.8	15.3	12.4	
RMW ³ (pounds/patient days)	4.0	3.2	4.5	
Hazardous Waste ⁴ (pounds/patient days)	0.30	0.27	0.30	

1) Some of the solid waste numbers from facilities that treat RMW onsite may inadvertently contain treated RMW (e.g. RMW/treated onsite by autoclave before being landfilled), which drives the solid waste percentages up and the RMW percentages down.

2) Recycling includes only recycling as defined in Appendix A of the Partner for Change Award application. Practice Greenhealth uses a methodology that differentiates between waste diversion and reuse, and formal recycling programs. No waste diversion is included in recycling totals.

3) RMW includes regulated medical waste and non-hazardous pharmaceutical waste.

4) The hazardous waste percentages were generally reported as less than 1 percent, but this number should not be zero for any hospital. This number may actually increase at a facility as their awareness for identifying and properly handling RCRA hazardous pharmaceutical waste increases.

TABLE 10: AVERAGE ANNUAL WASTE GENERATION NORMALIZED BY STAFFED BED

Waste Type	Total	Smaller Hospitals	Larger Hospitals	Your Data
Solid Waste ¹ (pounds/staffed bed/day)	17.3	16.7	17.5	
Recycling ² (pounds/staffed bed/day)	9.1 ¹	8.9	8.8	
RMW ³ (pounds/staffed bed/day)	2.7	1.9	3.2	
Hazardous Waste ⁴ (pounds/staffed bed/day)	0.20	0.17	0.22	

1) Some of the solid waste numbers from facilities that treat RMW onsite may inadvertently contain treated RMW (e.g. RMW/treated onsite by autoclave before being landfilled), which drives the solid waste percentages up and the RMW percentages down.

2) Recycling includes only recycling as defined in Appendix A of the Partner for Change Award application. Practice Greenhealth uses a methodology that differentiates between waste diversion and reuse, and formal recycling programs. No waste diversion is included in recycling totals.

3) RMW includes regulated medical waste and non-hazardous pharmaceutical waste.

4) The hazardous waste percentages were generally reported as less than 1 percent, but this number should not be zero for any hospital. This number may actually increase at a facility as their awareness for identifying and properly handling RCRA hazardous pharmaceutical waste increases.

TABLE 11: AVERAGE ANNUAL WASTE GENERATION NORMALIZED BY ADJUSTED PATIENT DAY¹

Waste Type	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Solid Waste ² (pounds/APD)	14.0	12.3	15.3	
Recycling ³ (pounds/APD)	7.5	6.8	7.7	
RMW ⁴ (pounds/APD)	2.3	1.6	2.8	
Hazardous Waste ⁵ (pounds/APD)	0.17	0.15	0.18	

1) Adjusted Patient Days = Total Patient Days x (Total Patient Revenue/Inpatient Revenue) Where Total Patient Revenue = Inpatient Revenue + Outpatient Revenue.

2) Some of the solid waste numbers from facilities that treat RMW onsite may inadvertently contain treated RMW (e.g. RMW/treated onsite by autoclave before being landfilled), which drives the solid waste percentages up and the RMW percentages down.

3) Recycling includes only recycling as defined in Appendix A of the Partner for Change Award application. Practice Greenhealth uses a methodology that differentiates between waste diversion and reuse, and formal recycling programs. No waste diversion is included in recycling totals.

4) RMW includes regulated medical waste and non-hazardous pharmaceutical waste.

5) The hazardous waste percentages were generally reported as less than 1 percent, but this number should not be zero for any hospital. This number may actually increase at a facility as their awareness for identifying and properly handling RCRA hazardous pharmaceutical waste increases.



IV. COSTS OF HEALTH CARE WASTE STREAMS

Waste Costs

Hospitals in this data set spent over **\$44 million on waste treatment and disposal**, highlighting once again the importance of source reduction, diversion, recycling and the smart use of resources. **Average waste disposal costs per ton** were higher in 2013 than in 2012 in all waste categories with the exception of recycling, where disposal costs and revenue were lower in 2013 than in 2012. However, solid waste and RMW costs were not as high as reported in 2011 (see **Table 12**). A fairly wide variation in cost or revenue derived from recycling activities was noted:

- **Recycling revenue** for hospitals reporting a profit was **\$91.50 per ton**
- **Recycling costs** for hospitals reporting an expenditure was **\$98.80 per ton**

One factor for consideration in evaluating cost fluctuations is whether hospitals are getting better at tracking auxiliary costs associated with waste disposal. Line items such as container rental, fuel surcharges and other fees can make a significant difference in cost per pound or per ton data. The more granular and refined this data set is, the more accurately hospitals can assess and reevaluate waste contracts to optimize costs.

TABLE 12: AVERAGE COSTS OF WASTE STREAMS

Waste Stream	Solid Waste Cost per Ton	Recycled Cost per Ton ¹	RMW Cost per Ton ²	Hazardous Waste Cost per Pound ³
Average of all hospital winners 2013	\$110	\$98.80 for hospitals reporting costs	\$949	\$6,800/ton (\$3.40/pound)
		\$91.50 for hospitals reporting savings		
Average of all hospital winners 2012	\$105	\$113 for hospitals reporting costs	\$905	\$6,400/ton (\$3.20/ pound)
		\$109 for hospitals reporting savings		
Average of all hospital winners 2011	\$126	\$90 ⁴	\$1,015	\$6,200/ton (\$3.10/pound)

1) Recycling category includes recycling only, no diversion or reuse.

2) RMW includes regulated medical waste and non-hazardous pharmaceutical waste.

3) Hazardous waste includes RCRA regulated pharmaceutical waste.

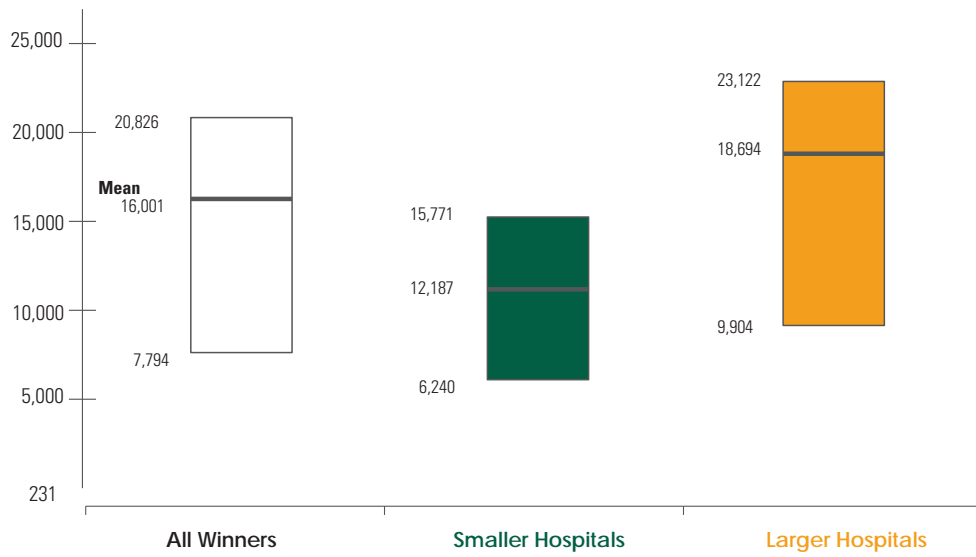
4) Data for recycling from 2011 was calculated differently.

Figure 4 compares **total waste costs per OR**, the best correlating factor for 2013 data, and illustrates, while holding other variables constant, that:

- Larger hospitals had higher waste costs per OR
- Larger hospitals averaged nearly **\$18,700** in waste costs **per OR** annually
- Smaller hospitals averaged nearly **\$12,200** in waste costs **per OR** annually

FIGURE 4: TOTAL ANNUAL WASTE COSTS PER OPERATING ROOM

Figure 7. Total Annual Waste Cost per Operating Room



V. WASTE BREAKDOWN



Regulated Medical Waste

Table 13 presents data showing that **larger hospitals** have **higher rates** of **regulated medical waste** (RMW) generation than **smaller hospitals**. This gap does not shift significantly when normalized by patient days, staffed beds or APDs. There are a number of considerations that may come into play when analyzing this data. One possibility is that larger hospitals may be treating sicker (or higher acuity level) patients. Level IV trauma centers and Level IV neonatal intensive care units (NICUs) tend to be concentrated in larger hospitals. Larger hospitals may also have more diagnostic and research laboratories onsite—which may add to the volume of RMW generated. Practice Greenhealth plans to test this assumption by asking award applicants for case mix index and average length of stay data in the 2014 Partner for Change Award application.

Beyond the average RMW generation rates for small and large hospitals, Practice Greenhealth helps its members understand what the top performers are achieving in this space.

- In 2013, **the top achievers in low RMW** generation (the top 10 percent of all hospitals having the lowest RMW generation rates) reported an average of 2.3 percent of their waste as RMW.

TABLE 13. METRICS FOR REGULATED MEDICAL WASTE

Metric	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
RMW as % of Total Waste	9%	7%	10%	
Lbs of RMW/Patient Day	4.0 lbs	3.2 lbs	4.5 lbs	
Lbs of RMW/Staffed Bed/Year	2.7 lbs	1.9 lbs	3.2 lbs	
Lbs of RMW/APD	2.3 lbs	1.6 lbs	2.8 lbs	

New this year, RMW data was analyzed for composition and cost of treatment and disposal. **Figures 5 and 6** present data from hospitals that were able to separately track and report on the different types of RMW managed at their facilities. These figures illustrate that non-hazardous pharmaceutical waste and incinerated RMW disposal costs are larger than their respective percentage of the RMW waste stream.

- **Non-hazardous pharmaceutical waste** makes up **10 percent** of the **total RMW** generation but accounts for **25 percent of RMW disposal costs**
- **Incinerated RMW** makes up **seven percent** of total **RMW** generation but accounts for **11 percent of RMW disposal costs**

FIGURE 5: AVERAGE RMW WASTE PROFILE

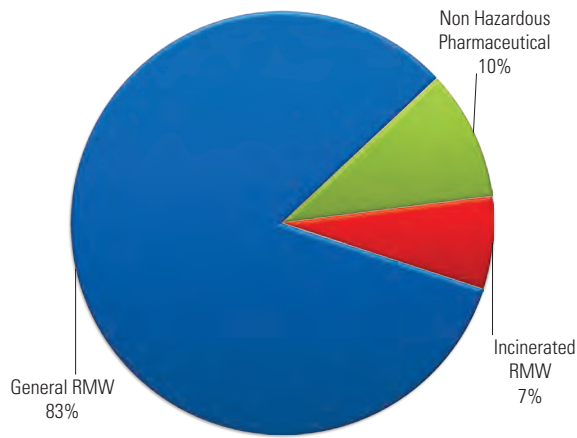
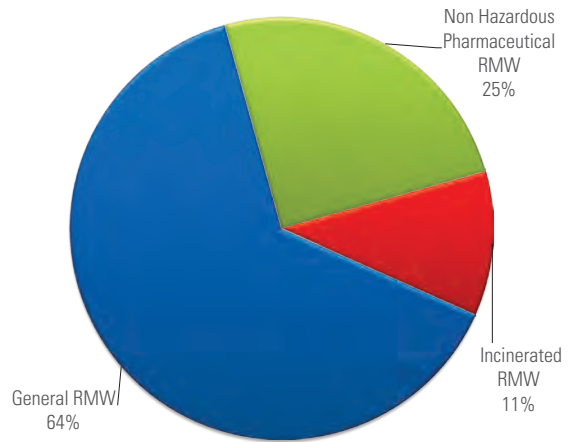


FIGURE 6: AVERAGE RMW WASTE COST PROFILE



Hazardous Waste

Hazardous waste is the most expensive waste (by pound) generated at any hospital. New this year, **hazardous pharmaceutical waste generation and disposal costs** were broken out from the main hazardous waste data. Results are presented in **Table 14** for hospitals that were able to break out their hazardous pharmaceutical waste data.

TABLE 14. HAZARDOUS WASTE GENERATION AND COST

Hazardous Waste	Regulated Hazardous Waste	Regulated Hazardous Pharmaceutical Waste
Waste Distribution	65%	35%
Cost Distribution	60%	40%

This data makes it clear that there are not significant differences in the cost of handling RCRA-hazardous pharmaceuticals as compared to more typical RCRA hazardous. There are, however, remarkable differences between the cost of RCRA hazardous waste management and hazardous waste “recycling,” under the Universal Waste Rule. Hospitals need to ensure that they are handling as much of their hazardous waste as allowable (per state-specific and federal rules) through universal waste protocols to maximize cost efficiency and reduce environmental impact.

Solid Waste

Donations

Hospitals have made a big commitment to donating unused or expired medical supplies and equipment to those in need. Health care donations greatly benefit recipients but also benefit the donor by avoiding disposal costs, keeping waste out of solid waste landfills, and “doing the right thing,” by helping our neighbors. The World Health Organization, however, estimates that over **70 percent of equipment donated to developing countries does not work because it is not suitable for the needs of the population**³. For a guide on the ins and outs of proper medical surplus donation, see the Catholic Health Association’s 2013 guide on [Responsible Redistribution](#).

³ Technologies for Global Health. The Lancet, Volume 380, Issue 9840, Page 447, 4 August 2012. doi:10.1016/S0140-6736(12)61273-2

[of Medical Supplies & Equipment](#). The report shares the findings of a 2012 research study to determine high-impact practices hospitals and health system should use when starting or enhancing a medical surplus recovery program.

Table 15 presents the most commonly donated items in order of occurrence. At **least eighty percent** of winners reported donating **clinical items, medical equipment and furniture**.

TABLE 15: DONATIONS

Donated Item	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Clinical Items	85%	86%	85%	
Medical Equipment	80%	79%	82%	
Furniture	82%	81%	83%	
Books	47%	44%	52%	
Other Supplies	43%	45%	40%	
Linens	38%	35%	44%	

Paper Reduction

Practice Greenhealth began tracking paper reduction efforts at hospitals in its 2012 Sustainability Benchmark Report. Paper reduction efforts for this past year are presented in Table 16.

- **75 percent** of all hospitals have a **coordinated effort to reduce paper**
- **Over 70 percent** of all hospitals have **reduced the number of reports automatically generated**
- Not surprisingly, **larger hospitals** were more likely to have implemented **electronic medical records (EMR)**
- Approximately **half of winners** have **reduced the number of network printers** and use **double-sided printing** as the **default**
- **Smaller hospitals** used **more paper per adjusted patient day** and **more per employee**

TABLE 16. PAPER REDUCTION

Paper Reduction	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Implemented an electronic medical records (EMR) system	77%	66%	85%	
Made a coordinated effort to reduce paper	75%	71%	77%	
Reduced the number of reports that are automatically printed	72%	73%	70%	
Reduced the number of network printers	59%	63%	57%	
Made double-sided printing the default on network printers	53%	46%	54%	
Reams of paper used per APD	0.33	0.38	0.28	
Reams of paper used per FTE	20.5	26.6	14.9	

Recycling

Hospitals in the data set significantly **reduced** their **waste disposal costs** through recycling. Recycling rates have continued to increase at Practice Greenhealth member hospitals. This year's **top performers** (top 10 percent for all hospitals) **recycled** an impressive **56 percent of their waste**.

- Recycled 92,680 tons of solid waste, avoiding **\$10.2 million** in **solid waste costs**
- Recycled 2,250 tons of universal waste, avoiding **\$15.3 million** in **hazardous waste costs**

When asked if their recycling programs make or lose money, applicants indicated:

- 25 percent reported making money
- 31 percent reported losing money
- 16 percent reported breaking even
- 28 percent indicated they can't or don't track.

Figure 7 illustrates that while **universal waste** makes up approximately **three percent of total recycling tonnage**, it accounts for **21 percent of recycling costs**. It is important to note, however, that while recycling hazardous waste may be more expensive than recycling solid waste, it is far less expensive than sending it out for disposal as hazardous waste.

FIGURE 7. AVERAGE RECYCLING WASTE PROFILE

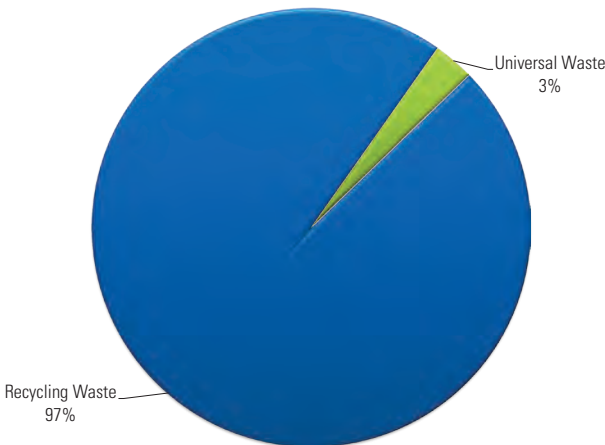


FIGURE 8. AVERAGE RECYCLING COST PROFILE

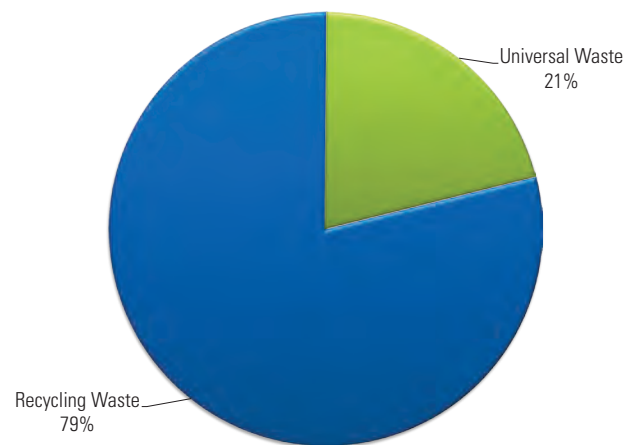


Table 17 presents the top **materials most commonly recycled**, listed from highest to lowest occurrence.

TABLE 17: RECYCLED MATERIALS LISTED BY OCCURRENCE (HIGHEST TO LOWEST)

Recycled Materials	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Batteries (universal waste)	94%	93%	96%	
Fluorescent Lamps (universal waste)	90%	79%	78%	
Commingled and Single-Stream Recycling	89%	88%	89%	
Computers and Electronics (universal waste in most states)	87%	91%	85%	

Recycled Materials	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Cardboard	81%	83%	82%	
Oil (cooking)	80%	82%	81%	
Paper-HIPAA	71%	68%	75%	
Wood	61%	62%	61%	
Plastic, Mixed	59%	55%	63%	
Oil (motor)	58%	61%	56%	
Paper, Mixed	58%	56%	57%	

Table 18 presents data on recycled items that were the highest revenue generators (by bed) for Award-winning hospitals. Only three materials generated revenue over \$1.00 per bed; **revenue per bed** was generated from: solvent distillation, X-ray films and ink jet and toner cartridges.

TABLE 18: RECYCLED MATERIALS SORTED BY MOST REVENUE PER BED

Recycled Items- Revenue per Ton	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Solvent	\$16	\$5 (Cost)	\$25	
X-Ray	\$7	\$10	\$4	
Ink	\$6	\$7	\$7	

Total Waste Generation

As discussed in last year’s Sustainability Benchmark Report, Practice Greenhealth has begun to measure **total waste** generation, where **total waste** is defined as the sum of: **solid waste, recycling, regulated medical waste (RMW) and hazardous waste tonnages**. Total waste gives a complete view of a facility’s waste generation, and also captures the impact of activities that reduce the generation of waste overall. Recycling tonnages are included because it represents waste originally generated by a facility.

Waste diversion and reuse is not included because different items have different reuse capacities (e.g., a sharps container may be reused up to 400 times while a single-use medical device has much more stringent limitations on reuse—and is device-specific), making it very complex to measure accurately between hospitals year after year. That said, source reduction activities, diversion and reuse programs are measured indirectly **through reduced solid waste and RMW tonnages**. Hospitals with more advanced environmental programs should exhibit **lower total waste numbers**. Practice Greenhealth fully acknowledges that diversion and source reduction should be celebrated as preferable over recycling, since diversion prevents waste upstream, before it is created and is the ultimate goal. These activities are measured and valued within the Award applications; they are just not included in the recycling data.

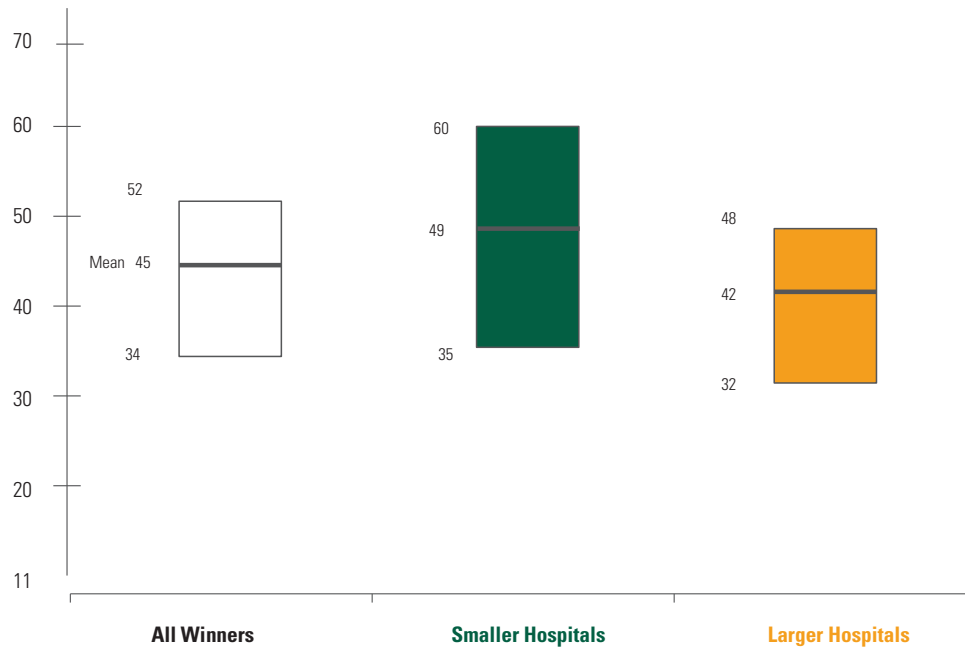
Table 19 presents total waste normalized by the two highest correlating factors, **patient days** and **staffed beds**. **Figure 9** gives a graphical representation of average annual **total waste** generation in **pounds per patient day**, with a particularly very good correlation between these two variables (**91 percent** of variation in total waste generation can be explained by the number of **patient days**).

- **Top performers in total waste generation** (an average of the top 10 percent of all hospitals **generating the least** amount of waste) was **23#/patient day**.

TABLE 19: AVERAGE ANNUAL TOTAL WASTE GENERATION NORMALIZED BY DIFFERENT FACTORS

Total Annual Waste Generation (Solid, Recycling, RMW and Hazardous Wastes)	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Total pounds/patient day	44.8	48.5	42.4	
Total pounds/staffed bed/day	29.5	27.5	30.3	

FIGURE 9: AVERAGE ANNUAL TOTAL WASTE IN POUNDS PER PATIENT DAY





VI. WASTE REDUCTION

Regulated Medical Waste (RMW) Reduction

Regulated medical waste (RMW) reduction is an important part of any hospital's waste program. Removing solid waste from the medical waste stream saves hospitals millions of dollars a year in unnecessary waste costs. Over **90 percent** of winners have staff education and RMW reduction programs; the overwhelming majority use RMW reduction techniques reported in **Table 20**. **Single-use device (SUD) reprocessing** reduces solid and RMW waste costs, while purchasing reprocessed devices saves Award-winning hospitals **millions of dollars annually** (data presented below).

TABLE 20: RMW REDUCTION TECHNIQUES

RMW Reduction Techniques	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Have engaged in an RMW education and reduction program	91%	91%	92%	
Use single-use device (SUD) reprocessing	82%	80%	85%	
Have posted waste segregation posters at red bag collection areas	81%	77%	86%	
Have implemented a reusable sharps container program	73%	69%	78%	
Use a fluid management system in the OR	66%	66%	70%	

Single-Use Device (SUD) Reprocessing

As reprocessing of single-use devices (SUDs) continues to grow, hospitals continue to save money. New this year, **Table 21** presents the top ten devices most commonly reprocessed. **Pulse oximeters** top the list, closely followed by the **ultrasonic scalpel**. Interestingly, the data suggests that **smaller hospitals** are significantly more likely to reprocess the top three items in this list, and somewhat **more likely to reprocess** most of the items on the list.

TABLE 21: MOST COMMONLY REPROCESSED SUDS (SINGLE-USE DEVICES) – HIGHEST TO LOWEST

	Device	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
1	Pulse Oximeter	61.8%	67.8%	38.7%	
2	Ultrasonic Scalpel	60.2%	70.2%	49.5%	
3	Pneumatic Tourniquet Cuff	58.4%	65.3%	48.5%	
4	Ultrasound Electrophysiology Catheters	58.0%	53.8%	62.5%	
5	DVT Compression Sleeve	56.8%	61.3%	53.3%	
6	Cold Laparoscopic Instruments	55.9%	59.6%	50.0%	
7	Trocars	52.8%	56.4%	49.0%	
8	Blood Pressure Cuff	52.0%	53.7%	47.4%	
9	Hot Laparoscopic Instruments	50.6%	55.1%	46.2%	
10	Electrophysiology Catheters	50.2%	45.5%	53.1%	

Savings from diverted disposal costs and purchasing reprocessed devices is reported in **Table 22**. Hospitals in the data **set saved over \$3 million dollars** from **SUD reprocessing** and prevented **680 tons of waste** from going into solid waste or RMW disposal. On average, **hospitals saved \$184 per staffed bed**. Smaller hospitals tended to save more per bed, per patient day and per OR.

TABLE 22: SINGLE-USE DEVICE REPROCESSING SAVINGS

SUD Reprocessing	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Savings from reduced disposal costs	\$3,111,340	\$854,991	\$2,217,104	
Savings from purchasing items instead of OEM	\$17,427,861	\$3,117,692	\$14,021,169	
Total annual savings (sum of facilities)	\$20,539,201	\$3,972,683	\$16,238,273	
Average annual (total) savings per staffed bed	\$623	\$655	\$602	
Average annual (total) savings per patient day	\$2.49	\$2.48	\$2.48	
Average annual (total) savings per operating room	\$10,584	\$10,093	\$10,956	
Tons of waste diverted annually from landfill (sum of all facilities)	680	150	519	
Average annual pounds of waste diverted from landfill per staffed bed	\$0.02	\$0.02	\$0.02	
Average annual pounds of waste diverted per operating room	\$0.37	\$0.40	\$0.37	

Reusable Sharps Container Programs

Award winners **saved nearly \$688,000** and diverted **over 2,000 tons** of waste through **reusable sharps container** programs as shown below in **Table 23**. In addition to cost savings, hospitals saved on average, **\$19 per licensed bed** and **diverted 0.07 pounds of waste per licensed bed** from solid waste or RMW disposal. **Larger hospitals** showed significantly **more savings per licensed bed**.

TABLE 23. REUSABLE SHARPS CONTAINER PROGRAM SAVINGS

Reusable Sharps Containers - Avoided Costs from Waste Disposal				
Reusable Sharps Containers Savings	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Total annual savings from avoided landfill fees (sum of facilities)	\$687,900	\$51,550	\$636,350	
Average annual savings from landfill fees per licensed bed	\$19	\$19	\$32	
Reusable sharps containers - waste diverted from disposal				
Tons of waste diverted annually from disposal (sum all facilities)	2,064	296	1,768	
Average annual pounds of waste diverted per licensed bed	131	112	144	

Greening the Operating Room

Progress in making ORs more sustainable was measured in the following areas: waste reduction and prevention, plastics recycling, environmentally preferable purchasing (EPP), the transition to reusable items, and energy and the built environment in the OR. Highlights of the data reported in **Table 24** include these measures **in the OR**:

Waste Prevention

- **83 percent** of winners **segregated non-infectious waste** in the OR
- Only **15 percent** tracked waste volumes **specific to the OR**

Plastics Recycling

- **Saline bottles and rigid trays** were the most commonly recycled medical plastics in the OR

Environmentally Preferable Purchasing

- 75 percent of winners **reformulate OR kits** to reduce excess supplies
- 75 percent purchase reusable **rigid cases** for sterilization in OR

Reusables

- The most common **reusable items** in the OR were **reusable surgical towels** and **reusable basins**
- **Reusable surgical towels and gowns** were the most likely recycled linens
- Over **half of all winners** reported **contracting with a third party reprocessor for the sterilization of reusable surgical textiles**

Energy and Built Environment

- **58 percent** utilize **LED surgical lighting**
- Almost **half of winners** reported **installing rubber flooring** or other **non-PVC flooring** in their ORs
- 44 percent programmed HVAC systems to reduce air changes when the ORs were unoccupied
- **39 percent use occupancy sensors for lighting**
- **11 percent track energy use specifically in the OR**

TABLE 24: GREENING THE OR® INITIATIVE

Waste Reduction and Prevention in the OR	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Segregate non-infectious from infectious waste in the OR	83%	87%	81%	
Ensure non-hazardous OR waste is going to solid waste or recycling	75%	77%	73%	
Track waste volumes from the OR	15%	14%	15%	
Plastics Recycling in the OR				
Recycle medical plastics from the OR	78%	75%	71%	
Saline bottles	67%	70%	63%	
Rigid trays	59%	63%	59%	
Blue wrap	53%	55%	54%	
Overwraps	42%	43%	45%	
Environmentally Preferable Purchasing in the OR				
Reformulate OR kits to reduce excess supplies and overage currently going to trash or donation	75%	73%	78%	
Purchase reusable rigid cases for sterilization in OR	75%	70%	79%	

Waste Reduction and Prevention in the OR	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Purchase reprocessed medical devices from third party reprocessor for use in OR	71%	71%	73%	
Replace disposable items with reusable items in OR kits where demonstrated safe and economically viable	58%	64%	52%	
Reusable Items in the OR				
Utilize reusable surgical towels	53%	57%	52%	
Utilize reusable basins	47%	54%	45%	
Utilize reusable surgical gowns for staff	36%	30%	42%	
Use reusable patient warming devices	29%	29%	30%	
Utilize reusable back table covers	18%	16%	20%	
Utilize reusable mayo stand covers	16%	11%	20%	
Use reusable grounding pads	12%	12%	14%	
Among the Hospitals Who Sterilize Reusable Surgical Textiles:				
Contract a third party	52%	56%	47%	
Sterilize in-house	26%	23%	29%	
Sterilize using in-house and using third party contractor for cleaning	18%	14%	23%	
Energy and the Built Environment in the OR				
Utilize LED surgical lighting to reduce energy use and increase thermal comfort	58%	52%	60%	
Use rubber flooring or other non-PVC flooring in the OR	49%	43%	52%	
Program HVAC system to reduce air changes when ORs are unoccupied to reduce energy use	44%	44%	47%	
Utilize occupancy sensors for lighting to reduce energy use in unoccupied ORs	39%	33%	44%	
Track energy use specifically in surgical services/OR	11%	5%	15%	



VII. CHEMICAL USE AND WASTE MANAGEMENT PROGRAMS



Chemical minimization programs are an extremely important part of any sustainability program. Practice Greenhealth understands that chemicals can provide many benefits in the provision of patient care and diagnostics. That said, a reexamination of which chemicals a hospital uses for what purpose makes a lot of sense considering the potential impacts that certain chemicals can have on human health and the environment if improperly used, spilled or disposed of. Moving to less toxic or non-hazardous chemicals can also benefit the facility's bottom line—by avoiding employee health issues and hazardous waste disposal fees.

While most new or replacement hospitals are built as mercury-free facilities, mercury is still a major target for elimination in older hospitals. Many institutions are still chasing the last vestiges of mercury out of their products, pharmaceuticals and equipment. Mercury reduction highlights from data reported in **Table 25** include:

- **88 percent** of Award-winning hospitals have implemented a **mercury-free purchasing policy** (with another nine percent in progress), and have inventoried all mercury-containing chemicals in the facility, including the laboratory
- **72 percent** have **eliminated B5 and Zenker** solutions in the laboratory, while an additional 17 percent never had it on site
- **69 percent** include mercury-free requirements in requests for proposals (**RFPs**) and contract language

Mercury

TABLE 25: MAKING MEDICINE MERCURY FREE

Mercury Free Program Elements	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Won the MMMF Award	55%	49%	62%	
Implemented a mercury-free purchasing policy				
Yes	88%	90%	85%	
In process	9%	8%	10%	
Inventoried all mercury-containing chemicals in the laboratory				
Yes	88%	89%	90%	
In process	6%	4%	1%	
Use low mercury (green tip) lamps	87%	81%	91%	
Handle fluorescent lamps:				
Ship to recycler	77%	77%	79%	
Lamp crusher	7%	7%	9%	
Other	16%	16%	13%	
Eliminated or reduced B5 and Zenker stains				
Eliminated	72%	63%	79%	
Reduced	11%	7%	14%	
Never had	17%	30%	7%	
Include mercury-free requirements in requests for proposals (RFPs) and contract language	69%	70%	67%	

Di-2-ethylhexyl Phthalate (DEHP) and Polyvinyl Chloride (PVC)

Table 26 reports on the progress that Award winners are making toward reducing the use of di-2-ethylhexyl phthalate (DEHP) and polyvinyl chloride (PVC) in their facilities. Approximately half of all Award winners implemented programs to reduce these chemicals. Smaller hospitals were more likely to have a general DEHP and PVC reduction program, while larger hospitals were more likely to have DEHP reduction program in the NICU—in part because they are more likely to have a NICU.

Di-2-Ethylhexyl Phthalate (DEHP) and Polyvinyl Chloride (PVC)

TABLE 26: DEHP AND PVC REDUCTION

DEHP and PVC Reduction	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
DEHP				
Have a program to reduce DEHP-containing products in the NICU	59%	49%	66%	
Have a general DEHP reduction program	57%	60%	63%	
PVC				
Have a PVC-reduction program	56%	60%	52%	
PVC-reduction program includes construction and renovation materials	53%	58%	45%	
PVC-reduction program includes medical products and supplies	49%	55%	43%	

Pharmaceutical Waste Management

Practice Greenhealth winners have come a long way in the past 10 years in understanding the complex area of waste pharmaceuticals. In **2009, only 65 percent** of Award winners had **implemented pharmaceutical waste management programs**, compared with **89 percent of winners this year**. This data shows a huge growth in understanding and implementation of these programs in just four short years.

Presented in **Table 27**, this year’s data indicates that hospitals are much more likely to **use internal analysis** and **their current waste vendor** to **identify pharmaceutical waste** before using another outside vendor. Hospitals are most likely to **separate pharmaceutical waste at the point of generation** and slightly over 30 percent have simplified their programs by **treating all pharmaceutical waste as hazardous**. By treating all pharmaceutical waste as hazardous, some hospitals have chosen to pay more for disposal, but are reducing time and costs to train staff and reduce the risk of errors in waste identification and segregation. An added benefit to this approach includes protecting the environment beyond what is required by law, since some non-RCRA regulated pharmaceutical waste can be harmful to human health and/or the environment if it mistakenly makes its way into an autoclave or a solid waste landfill.

TABLE 27: PHARMACEUTICAL WASTE MANAGEMENT PROGRAMS

Pharmaceutical Waste	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Management and Identification				
Have implemented a pharmaceutical waste management program	89%	87%	90%	
Used internal analysis to identify hazardous pharmaceuticals	66%	54%	65%	
Used our waste vendor to identify hazardous pharmaceuticals	63%	63%	55%	
Used outside waste vendor to identify hazardous pharmaceuticals	25%	26%	22%	
Waste Segregation				
Separate pharmaceutical waste at the point of generation	80%	74%	85%	
Send pharmaceutical waste back to pharmacy for proper segregation	39%	35%	43%	
Collect all pharmaceutical waste and sort in a satellite accumulation area	30%	27%	29%	
Treat all pharmaceuticals as hazardous waste	31%	32%	29%	

Ethylene Oxide (EtO) and Glutaraldehyde Reduction and Elimination

Many Award winners are working toward the elimination of ethylene oxide (EtO) and glutaraldehyde for disinfection and sterilization of their medical equipment due to their potential human health impact. On average, 65 percent of winners have **completely eliminated EtO**, most commonly using **steam sterilization** and **low temperature hydrogen peroxide gas plasma** as a replacement. Note: most hospitals reported using more than one alternative sterilization method, so the percentages in the table do not add up to an even 100 percent.

TABLE 28: ETO ELIMINATION

EtO	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Completely eliminated onsite use of EtO	65%	70%	65%	
Alternative	% using	% using	% using	% using
Steam sterilization	89%	92%	92%	
Low temperature hydrogen peroxide gas plasma	77%	74%	83%	
Peracetic acid	52%	57%	52%	
Ozone plasma	14%	17%	13%	

On average, **60 percent** of winners have **completely eliminated glutaraldehyde**, and most commonly are using **orthophthalaldehyde (OPA)** as a replacement. **Peracetic acid** and **steam sterilization** were most commonly cited as additional alternatives, but also included acetic acid, plasma, and ethyl alcohol.

TABLE 29: GLUTARALDEHYDE ELIMINATION

Glutaraldehyde	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Completely eliminated glutaraldehyde	60%	68%	56%	
Alternative	% using	% using	% using	% using
Ortho-phthalaldehyde (OPA)	85%	81%	88%	
Hydrogen peroxide	63%	66%	58%	

Green Cleaning

The area of **green cleaning** provides hospitals with an excellent opportunity to transition to **safer chemical use** in their facilities through environmentally preferable purchasing. While the efficacy of the institutional cleaning program is of paramount importance, there are a myriad of cleaning products that are validated as safer for human health and the environment by third party certifiers such as GreenSeal or UL-Ecologo. Progress in the area of green cleaning at Award-winning facilities is presented in **Table 29** and includes:

- **73 percent** of facilities have a **green cleaning plan** for their hospital
- Green-certified **all purpose** and **glass cleaners** topped the list of green cleaners most often used
- **94 percent** use a **dilution control system for chemicals**
- **88 percent** have **collaborated with** their **infection control committee** to identify areas where use of disinfectants can be minimized or eliminated
- **95 percent avoid aerosols** and **88 percent avoid fragrances** in products
- **Nearly 90 percent** of hospitals have **evaluated paper dispensing systems** to ensure optimal product efficacy and choose bathroom paper products with **recycled content**
- In the area of **flooring and floor care**, Award winners have achieved **significant progress since 2010**. **Microfiber mop use** is up from **84 percent in 2010** to **94 percent this year**. While **64 percent** of hospital winners in **2010** had **installed flooring that does not require regular stripping and waxing**, the number climbed to **81 percent** of this year’s winners; a considerable gain in only three years. Even more progress was observed in the area of using **powered cleaning equipment** that is **tested by the CRI Green Label Plus program** or is otherwise certified, increasing from **54 percent in 2010** to **81 percent** this year

TABLE 30: GREEN CLEANING

Green Cleaning	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Have a building-specific green cleaning plan for their facility, such as the one outlined in the Green Seal Certification Checklist, standard GS-42	73%	70%	74%	
Environmentally preferable products used:				
General purpose (hard surface) cleaners	74%	74%	75%	
Glass cleaners	73%	73%	72%	
Floor cleaners, strippers, waxes	52%	51%	55%	
Carpet and upholstery cleaners	47%	46%	50%	
Laundry soaps/cleaners	26%	29%	26%	
Liquid or foam hand soap	24%	25%	21%	
Cleaners				
Use a dilution control system for chemicals	94%	94%	95%	
Collaborated with the infection control committee to identify areas where use of disinfectants can be minimized or eliminated	88%	87%	88%	
Disposable Products - Do You:				
Avoid aerosolized cleaning products	95%	95%	97%	
Evaluated paper dispensing systems to ensure optimal product efficacy	89%	89%	90%	
Select bathroom paper products with a preference for recycled content	88%	85%	91%	
Use fragrance-free products	88%	89%	89%	
Avoid fragrance-emitting devices , e.g. air fresheners, fragrance or deodorizer sprays and urinal blocks	72%	69%	74%	
Select bathroom paper products with a preference for chlorine-free products	67%	62%	75%	
Powered Cleaning Equipment¹				
Use or specify powered cleaning equipment (scrubbers, burnishers, extractors, vacuums, or power washers) that is tested by the CRI Green Label Plus program or is otherwise certified	81%	81%	87%	
Flooring				
Use micro fiber mops	94%	95%	94%	
Installed flooring that does not require regular stripping and/or polishing	81%	75%	90%	
1) Green Seal does not certify powered cleaning equipment, however the Carpet and Rug Institute has a Green Label program for vacuums and carpet cleaning equipment.				

Integrated Pest Management (IPM)

Integrated pest management, or **IPM**, is an alternative approach to solving pest problems while minimizing risks to people and the environment. The technique strives to **eliminate the pest’s habitat** (food, shelter, water) and their point of **building access** instead of spraying or otherwise using hazardous chemicals. Details of program

characteristics implemented by Award winners are reported below in **Table 31**. One hospital summed up their comprehensive IPM program with this description:

- “We employ **all principles of Green IPM** including sanitation, mechanical exclusion, biological controls, inspections, monitoring, education, communication, cooperation, and sealing and caulking.”

A number of hospitals reported using well-known vendors for addressing pest issues; however hospitals should remember to **require IPM services** as first approach in their vendor contracts to get full use of these techniques. To this end,

- **75 percent** of winners **contracted with pest control companies** that **meet 100 percent of the requirements for IPM certification**
- **71 percent** reported ensuring their **IPM policy** is included in **all pest control bid specifications** when outsourcing pest elimination contracts

At least one facility took **vendor certification** one step further:

- “Each month, our **vendor performs “rounds”** on 100 percent of the facility and identifies opportunities to use non-pesticide treatments to prevent pests; we’ve also been **sending our pest vendor reports to a third-party auditor**, making their **recommendations requirements** for the **vendor.**”

While **86 percent** of winners reported **reducing the use of chemical pesticides through the implementation of an IPM program**, only **half** reported development of a **plan for training all hospital staff** on pests, pesticides, and their role in the facility IPM program. This looks like an opportunity that could be addressed with a few slides during employee orientation. Another **staff training** / reinforcement approach included:

- Our epidemiology and EVS associates are included in the **nursing floors** daily morning and evening **“huddles.”** These “huddles” have been very effective in communicating issues such as waste stream and recycling, RMW proper disposal, the **bed bug awareness** and infectious control issues.

One successful multi-pronged approach for the treatment of **bed bugs**, a very common problem, included:

- **“Bed bugs** continue to be a constant daily **challenge**. The use of the **heat treatment room, modified blanket warmer, monthly routine canine inspections, and staff diligence** eliminated the need for any chemical treatment.”



TABLE 31: INTEGRATED PEST MANAGEMENT

Integrated Pest Management	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Has reduced the use of chemical pesticides through the implementation of an integrated pest management (IPM) program	86%	81%	90%	
Developed an IPM plan for the facility	79%	71%	84%	
Designated an IPM coordinator to supervise all pest elimination activity	76%	69%	81%	
Developed a plan for training all hospital staff on pests, pesticides, and their role in the facility IPM program	50%	50%	49%	
IPM Policy				
Contract with pest control companies that meet 100 percent of the requirements for IPM certification.	75%	70%	80%	
Ensure IPM policy is included in all pest control bid specifications when outsourcing pest elimination contracts	71%	66%	75%	

Solvent Distillation

Many Award-winning facilities have reported using **solvent distillation** to **reduce hazardous waste and solvent purchase costs**; these projects often provide a quick return on investment. Data is presented in **Tables 32 and 33**.

- 84 percent of Award-winning hospitals have onsite laboratories, and of these, nearly half are reaping savings from solvent distillation
- Nearly **40,000 gallons of solvent were distilled** instead of disposed as expensive hazardous waste
- Over **34,000 gallons of usable solvent** were produced (replacing 34,000 gallons of expensive virgin solvent that did not have to be purchased)

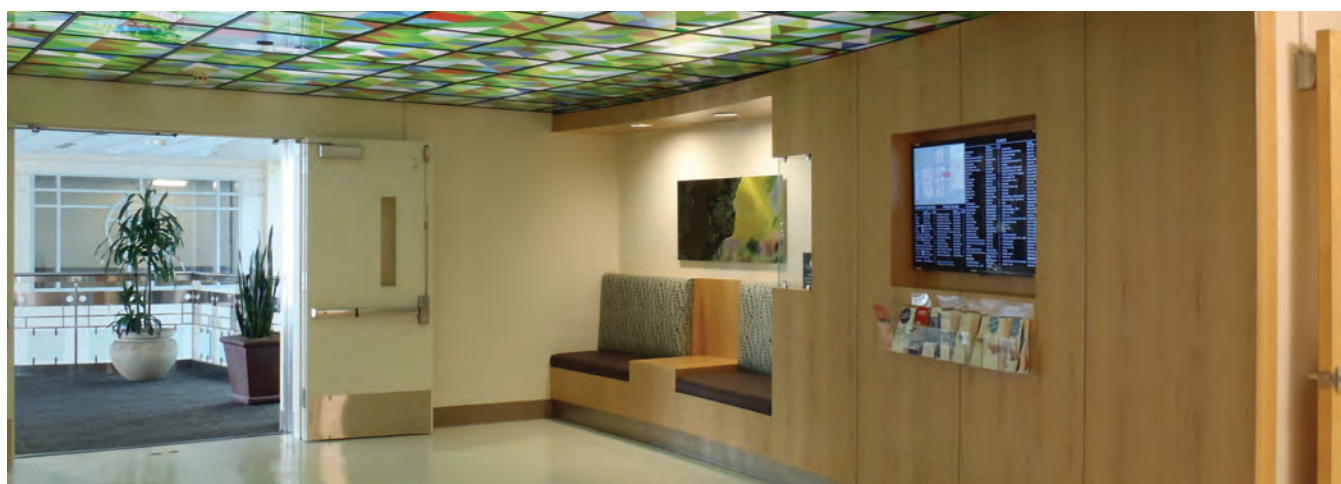
TABLE 32: SOLVENT DISTILLATION

Solvent Distillation	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Have an onsite laboratory	84%	76%	90%	
Have a program to recycle or distill solvents , alcohols or other chemicals from the lab	47%	35%	58%	

- Hospitals reported over **\$740,000** in savings from solvent distillation at their facilities
- Hospitals saved an average of nearly **\$100 per staffed bed**
- 2/3 of the savings was from **reduced purchase costs**
- 1/3 of the savings was from **reduced disposal costs**

TABLE 33: SAVINGS FROM DISTILLING SOLVENTS

Solvent Distillation	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Annual savings from reduced purchase costs (sum of all facilities)	\$504,785	\$43,500	\$461,290	
Annual savings from reduced disposal costs (sum of all facilities)	\$296,005	\$27,230	\$268,775	
Combined annual savings (sum of all facilities)	\$740,625	\$69,060	\$671,565	
Average savings per staffed bed	\$96	\$146	\$79	





VIII. ENVIRONMENTALLY PREFERABLE PURCHASING (EPP)

With the U.S. health care industry **spending** more than **\$200 billion annually**, hospitals have significant leverage to shift the market sector toward safer and more sustainable products and services. Purchasing practices matter within the sustainability spectrum. While many environmental programs begin with a focus on the “back door,” such as **waste management** and **recycling**, inevitably the institution will need to begin thinking about **moving upstream** to a better understanding of the organization’s **purchasing practices** and **use patterns**. Every product or service goes through an evaluation and selection process. By considering how to build **environmental health considerations** into the **product evaluation process**, hospitals can make remarkable progress in shifting to more sustainable materials, equipment and services. Practice Greenhealth is working in collaboration with its [EPP Business Leadership Coalition](#) and hospital members to develop a **total cost of ownership** model that will assist hospitals in conducting a more robust evaluation of the **true costs** (financial and health) of using certain products and services.

EPP is interconnected to **all aspects of hospital operations**, and is captured throughout this report in tables and data in every section. Purchasing practices play a role in every **environmental program** put into place—from **waste management contracts** to screening for undesirable **chemical constituents** in products, to the consideration of **alternative energy** sources or technologies. Affecting the purchasing process can be challenging, especially given that most of the supply chain is **incentivized and evaluated** based on their ability to **reduce upfront**, or “**first**” costs. More hospitals, however, are understanding that a **total cost of ownership** approach can work to better support the organization’s overall goal to **reduce cost** while also **protecting human health** and the **environment**. **Table 34** presents data on EPP practices at our Award winning facilities, with fully **93 percent** reporting communicating a desire for environmentally preferable products with their **GPO**.

TABLE 34: EPP PRACTICES

EPP Practices	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Have communicated a desire for environmentally preferable products with their GPO	93%	96%	92%	
Has an environmentally preferable purchasing policy (EPP)	71%	76%	65%	
Product evaluation committee considers environmental impacts in selection of medical devices ¹	65%	67%	66%	
In purchasing contracts , ask suppliers to track and provide EPP purchasing reports	38%	39%	37%	

Beyond the creation of an **environmentally preferable purchasing policy**, Practice Greenhealth works to identify which chemicals of concern are being addressed by these policies. **Table 35** indicates the **chemicals of concern** specifically included in **EPP policy language** at Award-winning hospitals. **Mercury** and **latex** top the field at an average of **77 percent** and **66 percent** inclusion, respectively.

TABLE 35: CHEMICALS OF CONCERN SPECIFICALLY INCLUDED IN EPP POLICY LANGUAGE

Material/ Chemical	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Mercury	77%	80%	74%	
Latex	66%	67%	62%	
PVC (vinyl, polyvinyl chloride plastics)	47%	48%	46%	
DEHP (di-2-ethylhexyl-phthalate)	46%	46%	48%	
Lead	44%	41%	45%	
PBTs (persistent bioaccumulative toxic substances)	44%	54%	40%	
Phthalates	42%	48%	39%	
Carcinogens, mutagens, reproductive toxics	41%	42%	38%	
VOCs (volatile organic compounds)	41%	39%	41%	
Halogenated, chlorinated or brominated flame retardants	38%	45%	35%	
Bisphenol A	36%	39%	35%	
Halogenated plastics	29%	33%	23%	
Perfluorinated compounds	23%	26%	21%	
Benzidine dyes and pigments	15%	20%	11%	
Lubricant paraffins	15%	18%	13%	

Purchasing policies often **include more** than just a list of **chemicals** of concern. **Energy** and **water efficiencies** and other topics are also of primary concern. **Table 36** highlights the percent of Award-winning hospitals that make other considerations an explicit part of their purchasing considerations. **Energy and water efficiency** top the list, with 64 percent of winners including energy efficiency, and 55 percent of winners including water efficiency **in their EPP language**.

TABLE 36: ATTRIBUTES SPECIFICALLY INCLUDED IN EPP LANGUAGE

Attribute	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Energy efficiency	64%	67%	61%	
Water efficiency	55%	58%	51%	
Whether the product becomes or generates hazardous waste	49%	57%	45%	
Excessive packaging	48%	51%	45%	
Durability/expected length of service	38%	35%	39%	
Reducing plastics that are not easy to recycle	26%	30%	24%	

Electronics

Stories of electronics waste (e-waste) being dumped in the third world have become commonplace, with 60 Minutes footage of children picking through smoldering masses of melted plastic with their fingers. In the U.S., the e-Stewards program estimates that **less than 15 percent** of electronic waste (such as computers, monitors,

cell phones and medical devices) is sent to recyclers for proper recycling and disposal. And a large percentage of the electronic waste that is sent for recycling does end up in developing countries where it is improperly handled, exposing communities to toxic air, soils, and water.

There are two **primary strategies** for addressing the health, safety and environmental issues associated with electronics. The first is to ensure that these electronics are safely and **properly recycled**. The second strategy is to **purchase electronics** that are manufactured to safer and more environmentally preferable standards. To avoid improper disposal, select e-waste recyclers (or ask your GPO for a list of e-waste recyclers) who have taken additional steps to demonstrate environmental responsibility. Practice Greenhealth suggests asking for recyclers who are certified to the [e-Stewards®](#) program.

- **67 percent** of winners use **EPEAT standards** for purchasing electronic equipment (**Table 37**)

To ensure the organization is **purchasing the most environmentally preferable electronics**, Practice Greenhealth recommends utilizing **EPEAT-registered electronics** for available categories. **Table 37** indicates that two thirds of Award winners (**67 percent**) reported using EPEAT standards for purchasing electronics. Large hospitals were more likely to specify EPEAT products. The federal government mandates that **95 percent** of applicable products be [EPEAT-registered \(White House Executive Order 13423\)](#) and requires the use of certified recyclers for electronic waste.

TABLE 37: ELECTRONICS AND ELECTRONIC PRODUCT ENVIRONMENTAL ASSESSMENT TOOL (EPEAT)

Activity	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Performed information technology (IT) energy efficiency upgrades	82%	76%	86%	
Use EPEAT standards for purchasing electronic equipment (Purchase EPEAT-registered products)	67%	63%	69%	
Have a policy requiring or preferring the purchase of EPEAT-registered products	32%	25%	34%	

Reusable Linens

While hospitals routinely purchase **reusable scrubs**, **Table 38** presents data on the percent of hospitals that are purchasing reusables for **more than half** of each linen type. The data identifies some **room for growth** in reusable linens, particularly in the area of reusable **surgical gowns** and **drapes**. Reusable surgical linens meet all AAMI/ANSI standards for appropriate barrier protection and have been found to provide [superior thermal comfort](#) for clinicians. A [recent lifecycle assessment](#) validated that reusable surgical linens have a better environmental footprint than their disposable counterparts. As noted above, in **Table 24**, **52 percent** of hospitals who utilize reusable surgical linens use a **third party** reprocessor. To learn more about a transition to **reusable surgical linens**, see Practice Greenhealth’s implementation module: [Moving \(Back\) to Reusables in the OR](#).

TABLE 38: REUSABLE LINENS

Purchase >50% Reusable Linens	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Patient Gowns	67%	61%	75%	
Surgical Gowns	28%	24%	31%	
Surgical Drapes	19%	17%	20%	

Reusable Containers

The use of **reusable containers** for supplies and waste management can significantly **decrease packaging waste**. **Table 39** presents data on the percentage of Award-winning hospitals that have switched to a specific set of reusable products. **Significant growth** in the purchase and use of reusable containers has occurred over the **last three years**:

- Reusable totes for internal deliveries increased from **60 percent to 86 percent**
- Reusable shipping containers increased from **45 percent to 71 percent**
- Reusable RMW containers increased from **41 percent to 70 percent**
- Reusable pharmacy waste containers increased from **36 percent to 69 percent**

TABLE 39: REUSABLE CONTAINERS

Reusable Products % using:	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Totes for internal deliveries	86%	82%	88%	
Shipping containers (totes)	71%	73%	73%	
RMW containers	70%	58%	77%	
Pharmacy waste containers	69%	74%	63%	





IX. FOOD

Food systems have a significant impact on the environment. The average piece of food travels between **1,500 and 2,500 miles from farm to plate**, creating greenhouse gases through transportation. Agriculture is incredibly environmentally intensive, using huge volumes of **water, pesticides**, and in the case of meat and poultry—**antibiotics**. This section of the application reports on **healthy and sustainable food strategies** being implemented at Award-winning hospitals.

Sustainably-produced foods are not just an absence of unhealthy inputs, but have many far-reaching benefits, and are more broadly defined as: being of **minimal harm** to the **environment**, **healthy** for consumers and producers, **fair** in terms of **wages** and working conditions for farmers and farm workers, respectful of **animal welfare**, and supportive of the **economic well-being** and **sustainability of communities**, both rural and urban. Making progress toward these goals, 84 percent of winners communicated with their distributors or vendors about increasing purchase of and offering healthier, more sustainable and local foods.

Table 40 presents which policies and pledges our winners have committed to:

- **69 percent** of winners have signed the **Healthy Food in Health Care Pledge**, a considerable increase from 47 percent in 2010
- **47 percent** have created a sustainable Food Services policy
- **40 percent** have committed to the **Healthier Hospitals Initiative (HHI) Healthier Food Challenge**

TABLE 40: SUSTAINABLE FOOD PRACTICES

Food Pledges	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Communicated with distributor or vendor about including more healthy, sustainable and local foods	84%	88%	86%	
Signed the Healthy Food in Health Care Pledge ¹	69%	73%	69%	
Worked with food service contractor to implement healthy food initiatives (e.g. sustainable and local food procurement; nutrition initiatives; farmers market, CSA, garden; food waste reduction and composting; etc.	68%	79%	64%	
Working with GPO on healthy food Initiatives	61%	63%	61%	
Created a sustainable food service policy	47%	54%	45%	
Taken the HHI Healthier Food Challenge	40%	37%	44%	

1) Healthy Food in Health Care Pledge: (http://www.noharm.org/lib/downloads/food/Healthy_Food_in_Health_Care.pdf)

Healthier Food Choices

Hospitals continue to make their food offerings both healthier and more appealing. **Professional chefs** may be working behind the scenes to prepare your meal in the cafeteria. **Table 41** presents a few of the healthier food programs implemented in the cafeteria and patient food services. Winners are simultaneously **eliminating trans fats and high fructose corn syrup** while **educating their local communities** on healthy eating and cooking.

- **45 percent** have programs to address **childhood obesity**

- **42 percent** have eliminated the standard practice of **free formula giveaways**
- **22 percent** have been designated a **baby-friendly hospital**

TABLE 41: HEALTHIER FOOD CHOICES

Healthier Food Choices	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Eliminated Trans Fats in cafeteria and/or patient food services	87%	85%	91%	
Educated our community via classes or literature on healthy eating and/or cooking , etc.	80%	82%	79%	
Reduced HFCS in cafeteria and/or patient services	69%	46%	43%	
Have programs to address childhood obesity	45%	51%	43%	
Eliminated standard practice of free formula giveaways	42%	36%	46%	
Have been designated a baby-friendly hospital ¹	22%	16%	28%	

1) baby-friendly hospital¹ <http://www.unicef.org/programme/breastfeeding/baby.htm>

Sugar-sweetened beverages (SSBs) and poor quality food in **vending machines** have received a lot of attention in conjunction with childhood and adult obesity. Issues around **bottled water** include **expense**, unwanted **plastic waste** and the **hydrocarbon footprint** of distribution. **Table 42** reports data on beverages and vending:

SSBs

- **28 percent** of our winners have taken the Healthier Hospitals Initiative Healthier Food Challenge beverage objective
- **89 percent** have reduced SSBs in the cafeteria; 72 percent in patient food services
- **73 percent** have reduced SSBs in vending machines

Bottled Water

Award winners have had the most success in **reducing bottled water** in **patient food services** and **meeting rooms**, and less success in the cafeteria and vending machines. This may be the result of ease or complexity of implementation, or a prioritized focus on the biggest areas of influence. In an apparent contraction, there can be merits to offering bottled water in vending machines as part of an SSB reduction program.



Beverages and Vending

TABLE 42: BEVERAGES AND VENDING

Beverages and Vending	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Have taken the Healthy Food Challenge' Healthier Beverage Objective	28%	26%	30%	
Among those who offered fewer sugar-sweetened beverages, reductions were in:				
Cafeteria	89%	87%	78%	
Vending machines	73%	73%	63%	
Patient food services	72%	72%	62%	
Catering	64%	76%	51%	
Picnics	35%	44%	24%	
Other venues	6%	6%	6%	
Other efforts				
Offered employees reusable water bottles, coffee or travel mugs	83%	85%	83%	
Provided healthier, sustainably-produced food in vending machines	77%	76%	78%	
Purchased fair trade coffee	66%	60%	71%	
Among those who have eliminated bottled water, eliminations were made in:				
Patient services	53%	32%	37%	
Meeting rooms	54%	44%	47%	
Catering	35%	37%	38%	
Cafeteria	17%	6%	9%	
Vending machines	15%	26%	7%	
1) The healthy beverage objective is one objective of the Healthier Hospitals Initiative's Healthier Food Challenge				

Local and Organic Food Procurement

Purchasing local and/or organic food is an important part of a hospital's **sustainable food operations**.

Organic food procurement is one strategy to reduce some of the negative influences of food production and distribution, including the overuse of **antibiotics, pesticide use, genetically engineered foods and climate change**. **Locally grown** food procurement supports the local economy, significantly reduces transportation miles, and offers staff, patients and visitors **healthier fare**. **Locally grown foods** may have been produced with reduced pesticide use, or grown organically, but may or may not have paid to become certified organic, so talk to your local farmers. Learn more about [local and sustainable purchasing initiatives in health care](#). **Table 43** presents the progress Award winners have made toward local and organic food procurement. Of note:

- **71 percent** have worked with vendors and suppliers to purchase locally grown food.
- **56 percent** have hosted a farmers market, generally onsite
- The most frequently purchased **local food** items are: **produce (74 percent) and dairy (64 percent)**

TABLE 43: LOCAL FOOD INITIATIVES AND PROCUREMENT

Farmers Markets	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Worked with vendors or suppliers to indirectly purchase locally grown food	71%	74%	75%	
Hosted a farmers market	56%	48%	62%	
Made direct purchases from local farmers, ranchers or cooperatives	36%	36%	39%	
Established relationships with local farmers/buy locally (<200 miles)	36%	36%	39%	
Have taken the local/sustainable objective of the Healthier Food Challenge	28%	31%	26%	
Offered an employee CSA (community supported agriculture) program	22%	19%	24%	
Hosted farmers market accepts food stamps (WIC)	10%	6%	10%	
Buying Local—we purchase the following items locally (<200 miles)				
Produce	74%	71%	77%	
Dairy	64%	55%	76%	
Eggs	34%	33%	36%	
Meats	33%	33%	36%	
Chicken	32%	31%	35%	
Fish	29%	32%	29%	

Balanced Menus: Reducing Meat

Reducing the overall **amount of meat** served in hospitals provides **health, social, and environmental benefits** that are consistent with **prevention-based medicine**. Hospitals can deliver an important **preventive health message** to patients, staff, and communities by **reducing** the amount of **meat and poultry** they serve and by **purchasing sustainably-produced meats** as an alternative. **Health Care Without Harm** challenges hospitals to commit to **balanced menus**, achieve a 20 percent reduction in meat and poultry purchases, and then invest cost savings in sustainable meat options.

- 31 **percent** of winners have accepted the **Balanced Menus Challenge**
- **Over half** have **reduced the use of red meat** with an average of **15 percent meat reduction**
- Almost **a third** have **purchased sustainably produced meat**, averaging **33 percent** of total meat purchased

TABLE 44: BALANCED MENUS

Initiative	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Have accepted the Balanced Menu Challenge ¹	31%	32%	31%	
Have reduced the use of red meat ²	51%	57%	49%	
If reduced meat, % reduction in meat purchases	15%	15%	15%	
Purchased sustainably produced meat where meat is used	29%	36%	24%	
If purchased sustainable meat, % of meat purchased that is sustainably produced	33%	33%	30%	
1) Balanced Menu Challenge: http://www.noharm.org/lib/downloads/food/Balanced_Menu.pdf				
2) HCWH Balanced Menu Program: http://www.noharm.org/lib/downloads/food/Balanced_Menu.pdf				

Reusable and Biodegradable Food Service Items

Food preparation, service and disposal are a **significant generator** of waste within health care institutions. The waste generated by **food serviceware** and packaging adds to the volume of non-food waste. Hospitals are making steady progress on addressing these waste streams, as **Table 45** illustrates.

Many hospitals have begun by exploring ways to **replace** the use of **polystyrene** (Styrofoam)—which to many feel is emblematic of many environmental issues. Transitioning to more **environmentally preferable food serviceware** can be complex—and requires taking into account the variety of foods and beverages the containers will need to safely hold as well as the cost of those containers. Learn more about the preferred hierarchy for sustainable [food serviceware](#) and general guidance on how to get started in this area. Highlights of our winners’ successes include:

- 94 percent use **reusables in patient food services**
- 80 percent have **eliminated polystyrene** in patient food services

TABLE 45: FOOD SERVICEWARE

Facilities who have Switched to some Reusable Food Serviceware	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Use reusables In patient food services	94%	74%	76%	
Use reusables In the cafeteria	42%	37%	30%	
Use reusables In other areas	11%	11%	6%	
Facilities that have Reduced or Eliminated Polystyrene, have:				
Eliminated polystyrene in patient service	80%	70%	66%	
Eliminated polystyrene in cafeteria	67%	50%	63%	
Reduced polystyrene in patient services	87%	79%	78%	
Reduced polystyrene in cafeteria	81%	75%	73%	
Compostable Food Ware: Our Food Services Program has:				
Use compostable/biodegradable (BPI) products in patient food services				
% compostable/biodegradable	32%	35%	32%	

Facilities who have Switched to some Reusable Food Serviceware	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Composts these items	14%	12%	18%	
Uses compostable/biodegradable (BPI) products in cafeteria				
% compostable/biodegradable	51%	49%	56%	
Composts these items	16%	7%	24%	



XI. GREEN BUILDING



Sustainable Design and Construction

As the economy begins to recover, hospitals are **considering many of the building and renovation projects** set aside in the last several years. A growing number of hospitals have begun to incorporate an array of green design elements into new building and major renovation planning. Almost half of Award winners are currently building or planning new building projects with an average of **63 percent** of hospitals planning to integrate **sustainable aspects into renovation projects** while the number for new/replacement hospitals was slightly smaller at 44 percent. Smaller hospitals were slightly less likely to integrate green elements at 38 percent than their larger counterparts at 50 percent. A [recent study](#) indicates that **the premium to achieve a green health care building** can be less than 1.25 percent of capital costs. **Table 46** highlights the adoption of green building and the corresponding certification or standards used by Award winners. **Table 47** identifies whether hospitals build LEED requirements or sustainable elements into contract language and/or reused demolition materials in the new build.

TABLE 46: GREEN BUILDING

Green Building	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Currently building or planning any new building projects	47%	42%	50%	
If yes, the new building project will incorporate green aspects	44%	38%	50%	
Currently building or planning any renovation projects	66%	60%	70%	
If yes, the renovation project will incorporate green aspects	63%	57%	66%	
Have a green or living roof	16%	7%	22%	
Following LEED guidelines but do not Plan on Certification				
Renovation	17%	12%	21%	
New construction	9%	6%	13%	
Both	23%	26%	19%	
Following LEED Guidelines and Applying for LEED Certification				
Renovation	2%	2%	2%	
New construction	19%	10%	24%	
Both	13%	16%	12%	
Utilized the Green Guide for Health Care				
Renovation	13%	11%	16%	
New construction	11%	8%	9%	
Both	28%	35%	24%	

TABLE 47: SUSTAINABLE DESIGN AND CONSTRUCTION

Sustainable Design and Construction	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Reuse/recycle demolition materials				
Renovation	7%	8%	6%	
New construction	6%	5%	8%	
Both	71%	66%	74%	
Add language to contract specifications that constructor will follow LEED or GGHC requirements				
Renovation	3%	4%	2%	
New construction	12%	8%	16%	
Both	42%	39%	41%	

Leadership in Energy and Environmental Design (LEED)

Developed by the U.S. Green Building Council (USGBC) in 2000, Leadership in Energy & Environmental Design (LEED) certification provides third-party verification that a building is designed and built using strategies to achieve high performance, environmentally preferable buildings. The new [LEED for Healthcare](#) standards were introduced in 2011, updating the more mainstream LEED for New Construction and Major Renovations guide with health-care-specific considerations. LEED HC was also built to reflect the Green Guide for Health Care and its emphasis on occupant and community health—in addition to patient safety. LEED considers building improvements in a range of different categories, including:

- Sustainable sites
- Energy and atmosphere
- Water efficiency
- Materials and resources
- Indoor environmental quality
- Innovation in design

The **Green Guide for Health Care (GGHC)** is a self-certifying toolkit that steers facilities through green design, construction and operations. Framing goals around health implications, the Green Guide helps to connect sustainability with the ultimate goal of healthy people on a healthy planet. Learn more at www.gghc.org.

Table 48 reports data on Award winners’ LEED-certified building and renovation projects. The table presents a summary of new LEED-certified building and renovation projects and also presents a summary of projects built or renovated following GGHC or LEED guidelines that did not pursue certification.

- LEED-certified and other **green building projects** totaled **nine million square feet**

TABLE 48. LEED BUILDING AND CERTIFICATION

All Award Levels	Certified	Silver	Gold	Platinum	Pending	Total Projects
LEED Certified						
# of new builds	2	14	8	0	5	55
Square feet built ¹	15,000	2,738,463	1,714,040	--	532,600	5,000,103
# of renovations	1	3	4	1	4	13
Square feet renovated	--	38,376	57,050	--	87,375	182,801
# New build plus renovations	1	2	2	0	1	6
Square feet renovated	--	73,000	120,000	--	--	193,000
Total square feet LEED certified	15,000	2,849,839	1,891,090	--	619,975	5,375,904
Not Certified						
New build designed to LEED but not registered	20 projects			2,443,428 Square feet		
New build followed GGHC	2 projects			481,745 Square feet		
New build other certification	3			186,000 Square feet		
Renovation designed to LEED but not registered	15 projects			465,890 square feet		
Total all Projects	90 Projects			XL= 9 Million Square Feet		
1) Note: Not all of the projects listed provided square footage. The actual square footage for most of these categories is actually larger.						





XII. ENERGY

Energy continues to be one of the most strategic areas for hospitals to find both cost-savings and environmental benefit. Energy use not only contribute to the amount of mercury in the environment, but also generates a range of other toxic air pollutants that can contribute to respiratory disease, asthma and other health implications. Energy usage is also a major factor in the generation of the greenhouse gases driving climate change. Energy security is also a consideration with overloaded energy grids and major storm events incapacitating health care providers. Reducing energy usage in hospitals can generate significant ongoing operational savings for the organization—increasingly critical at a time when budgets are taking such a hard hit.

An increasing number of hospitals and health systems are going beyond the energy use and cost roll-up numbers, and are tracking the energy use of their respective buildings in much greater detail—monitoring their monthly performance and looking for unexpected surges in energy use across their portfolios. Concurrently, hospitals are increasingly tying water savings and energy savings together more closely. This level of granularity in data collection will serve hospitals and health systems well, giving them better data with which to zero in on areas of opportunity. Energy is of such paramount importance that it is now making its way on to dashboards for executive leadership.

Award-winning hospitals have made impressive progress on the energy reduction front. A summary of average energy performance is reported in **Table 49** below. In this awards cycle (using 2012 data), Award winners:

- **Consumed 34.3 billion kBtus** of energy
- **Spent more than \$622 million** on energy
- Averaged **\$3.60 per square foot** in energy expenditures

Summary of Savings

- **Saved 531 million kBtus** of energy
- **Saved \$30.2 million** on energy expenditures
- **Saved \$0.21 per square foot**

TABLE 49: ENERGY EXECUTIVE SUMMARY

Energy	2013 All Winners
Consumption	
Total energy use (sum of all facilities in kBtus)	34.3 billion kBtus
Average energy use (per facility): kBtu/square foot	225 kBtus/square foot
Total energy expenditure	\$622 million
Average energy cost/square foot	\$3.60
Savings	
Total energy saved (through energy efficiency projects)	531 million kBtus
Total dollars saved	\$30.2 million
Average dollars saved per square foot	\$0.21 per square foot

Energy Characteristics

Practice Greenhealth encourages member facilities to participate in the **U.S. EPA's ENERGY STAR program**, and collect and track their associated energy and water data through the **Portfolio Manager** tool (Table 50). Benchmarking is vital because it allows facility operators to understand their hospital's energy usage as it relates to similar facilities. Health care facilities should not only benchmark with ENERGY STAR but also work to benchmark, when applicable, within their own systems.

- **72 percent** of Award winners reported being an **ENERGY STAR Partner**
- Over **half** reported completion of data collection using **Portfolio Manager**
- Average **ENERGY STAR rating** was **51**

TABLE 50: ENERGY CHARACTERISTICS

Energy Characteristic	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Are ENERGY STAR partners	72%	76%	68%	
If yes, average ENERGY STAR rating	51	51	51	
Completed data collection through portfolio manager	54%	53%	57%	
Participate in the E²C program (between ASHE and ENERGY STAR)	22%	17%	29%	
If not ENERGY STAR, has benchmarked facility	21%	20%	23%	

Energy Use and Cost

Hospitals consume an enormous amount of energy. Large hospitals consumed 5.5 percent of the total delivered energy used by the commercial sector in 2007 (EIA, 2012), and health care ranks second only to the commercial food sector for commercial energy usage. Regression analysis of energy data showed that **square footage** can explain **81 percent of the variation in energy use** between hospitals. The same analytical technique also showed that **square footage** could explain **78 percent of the variation in energy cost**. Understandably, price fluctuation in electricity and natural gas also play a major role in hospital costs from year to year.

- **Total energy use** for all hospitals = **35.8 billion kBtus**
- **Total energy expenditures** for all energy types combined = **\$587 million**

The best set of national comparison data comes from the [Commercial Buildings Energy Consumption & Efficiency Survey \(CBECS\) Large Hospital Report \(2007\)](#). CBECS analyzed energy data for hospitals that had more than 200,000 square feet of floor space. The average EUI for CBECS large hospitals was 234 as compared to Practice Greenhealth’s mean EUI of 225—demonstrating that Practice Greenhealth hospitals are outperforming the national average in energy efficiency.

TABLE 51: COMMERCIAL BUILDINGS ENERGY CONSUMPTION SURVEY (CBECS) ENERGY CONSUMPTION DATA

Energy Consumption per Square Foot (kBtus) ¹	EUI
All large hospitals (mean, N=3040)	234.1
Hospitals with 200,001-500,000 square feet	270.1
Hospitals with 500,001-1,000,000 square feet	233.4
Hospitals with > 1,000,000 square feet	212.8

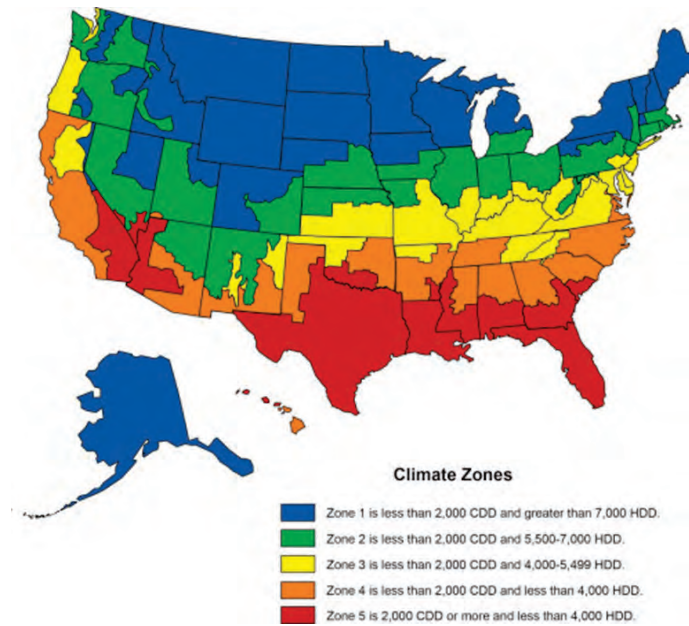
1) Figures in this table only include hospital buildings with over 200,000 square feet of floor space.

The [IFMA-ASHE-CHES Benchmarking 2.0 for Healthcare Facility Management Report](#) also provides a strong data set for hospitals but is not a usable comparison as the EUI data set is only comprised of electricity and natural gas use and does not include fuel oil, district heat (purchased steam) or chilled water. Practice Greenhealth plans to analyze this additional subset of information in future years to provide another comparison point.

Energy Use and Cost by Temperature Zones

Because energy use and fuel type are dependent on geographic location and climate, this year the energy data is presented by temperature zone as defined by the [Commercial Buildings Energy Consumption & Efficiency Survey \(CBECS\)](#). Climate zones are directly related to the number of heating and cooling-degree days, a measure of when a region’s temperature is above or below 65 degrees Fahrenheit, and representative of when a building must typically use energy to heat or cool the premises. **Figure 10** illustrates the U.S. Climate Zones for 2003 CBECS (currently being updated). For more information see the [CBECS Large Hospital Report, 2007](#).

FIGURE 10. ENERGY USE AND COST BY TEMPERATURE ZONES: CBCECS, 2003



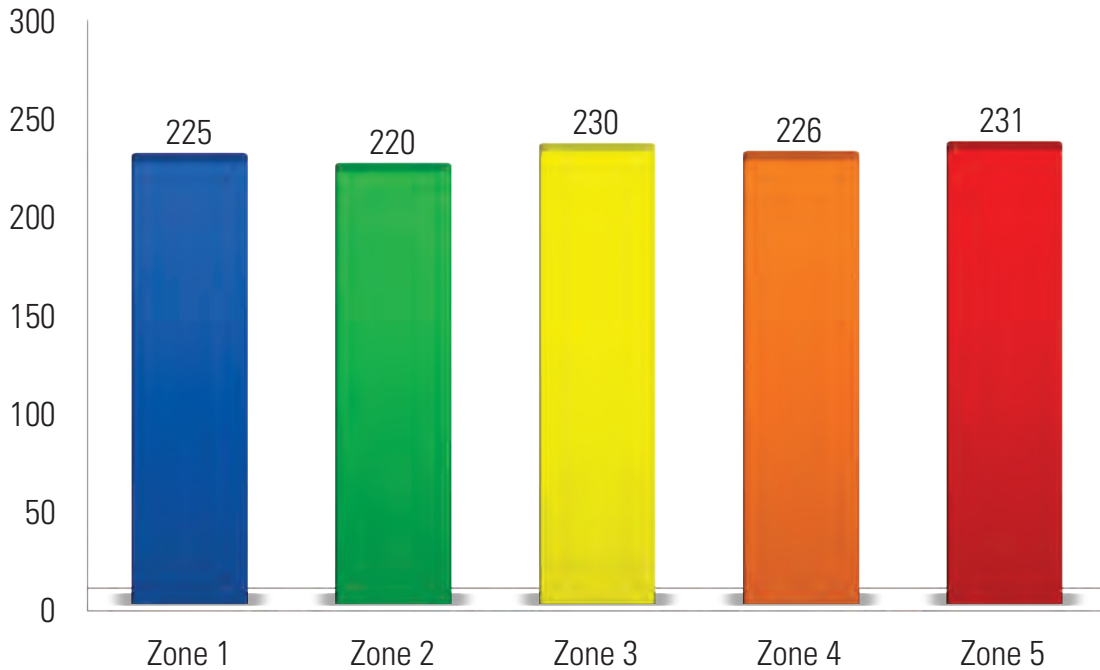
Again this year, the **best predictor of energy** use was **square footage**, followed by a strong correlation with the number of operating rooms at the facility—pointing again to the importance of drilling down to get area-specific energy use data, where possible. The number of patient days was the third best predictor of energy use. Table 51 highlights the average annual energy use and the data is illustrated in Figures 11 and 12.

- The average kBtu per square foot was highest in Zone 5 and lowest in Zone 2, but did not vary by more than five percent. High energy use in the south would be expected due to air conditioning costs as would lower energy use in zones without extreme heat or cold temperatures.

TABLE 52: AVERAGE ANNUAL ENERGY USE BY CBCECS CLIMATE ZONE

Climate Zone	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Cooling degree days	<2,000	<2,000	<2,000	<2,000	>2,000
Heating degree days	>7,000	5,500 to 7,000	4,000 to 5,499	<4,000	<4,000
Climate Zone	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Number of hospitals in each zone reporting energy use	33	51	45	33	12
Average energy use in kBtus per square foot	225	220	230	226	231
Total energy use in kBtus per operating room	11,536,394	11,863,469	13,172,425	15,914,000	11,731,425
Total energy use in MMBtus per operating room	11,536	11,863	13,172	15,914	11,731
Total energy use in kBtus per patient day	3,422	3,125	2,329	3,073	3,628

FIGURE 11. ENERGY USE: AVERAGE KBTUS PER SQUARE FOOTAGE BY CBECS CLIMATE ZONES



Energy Costs by Temperature Zone

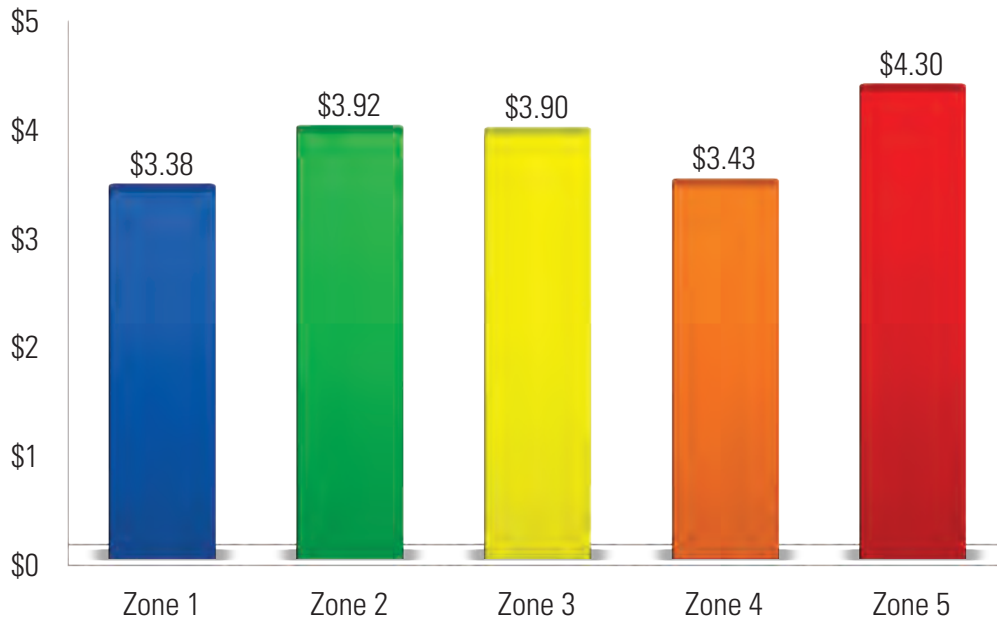
Hospitals in the data set spent **\$621 million** on energy expenditures last year. Energy costs vary by facility design, efficiency measures in place, and varying prices in different geographic locations. Energy expenditures by climate zone are presented in detail in **Table 52**. While average energy use in kBtus per square foot does not vary greatly by climate zone (illustrated above in **Figure 11**), there is more variation in energy costs, as illustrated in **Figure 12**. **Energy costs** for all winners **averaged \$3.74/square foot**.

- Average energy costs in \$ / kBtu were highest in Zone 5 at \$4.30 / square foot
- Average energy costs in \$ / kBtu were lowest in Zone 1 at \$3.38 / square foot

TABLE 53: ENERGY EXPENDITURE BY TEMPERATURE ZONES

Energy Expenditure in Dollars	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Total Mean
Electrical cost per square foot	\$2.40	\$2.94	\$2.74	\$2.68	\$3.45	\$2.76
Natural gas cost per square foot	\$0.84	\$0.84	\$0.82	\$1.89	\$0.80	\$1.03
Steam costs per pounds per square foot	\$2.06	\$1.40	\$1.15	\$0.95	NA	\$1.28
Oil costs per gallon per square foot	\$0.01	\$0.004	\$0.02	\$0.04	NA	\$0.02
Total energy cost per square foot	\$3.38	\$3.92	\$3.90	\$3.43	\$4.30	\$3.74
Total energy cost per APD	\$29.60	\$24.78	\$24.56	\$21.25	\$38.31	\$26.22
Total energy cost per operating room	\$191,575	\$192,197	\$197,571	\$201,511	\$228,543	\$197,741

FIGURE 12. ENERGY COSTS: AVERAGE TOTAL ENERGY COST PER SQUARE FOOTAGE BY CBECS CLIMATE ZONES



Renewable Energy Sources

Hospitals are increasingly exploring the potential to utilize or generate renewable energy sources. Many hospitals are just beginning to evaluate on-site and off-site renewable energy options, and are looking at ways to integrate a renewable energy strategy into the hospital’s overall energy management program.

Table 53 presents data on hospitals that utilize alternatives to conventional fossil-fuel-based energy sources for some portion of their energy portfolio. **Forty** of the Award-winning hospitals (or 20 percent) are using some form of renewable energy, up from 14 percent last year, a significant increase. While a number of facilities are purchasing renewable energy, at least one facility in Wisconsin is actively involved in the generation of renewable energy.

- **20 percent** of winners report purchasing or generating **renewable energy** in some capacity, up from 14 percent last year

TABLE 54: RENEWABLE ENERGY USE

Type of Alternative Energy	Number of Facilities Using	Range % Renewable of this Energy Type
Solar	12	5-40%
Wind	21	5-70%
Geothermal	6	5-30%
Hydro	27	5%-100%
BioMass	13	5%-30%
Biogas	4	5-30%
Other	5	5-10%
Total	40 different facilities	5-100%

Energy Efficiency

Significant energy costs and a concern for the environment have provided an impetus for hospitals to implement energy efficiency projects. **Table 54** provides some detail regarding these projects. The data provided in these two tables represents *only* those facilities that reported data for energy efficiency.

Award winners reported saving of over **\$30 million** last year from 482 reported energy projects implemented over the last five years. On average, these projects **saved** these hospitals **five percent** of their total energy costs—individual savings ranged from smaller to much larger. Last year, these projects **prevented the consumption** of over **533 million kBtus**.

- **Savings averaged \$0.21 per square foot**
- **Energy efficiency prevented emissions of 89,000 metric tons of CO₂e**

When the annual savings from projects implemented over the last five years are multiplied by the number of years since implementation, Practice Greenhealth's 198 Award winners have saved an astounding **\$110 million** in avoided energy costs! These projects prevented the consumption of **1.8 billion kBtus** (or 50 million MMBtus). An impressive energy savings for less than 200 hospitals over a five-year period.

TABLE 55: ENERGY EFFICIENCY: AWARD-WINNING HOSPITALS REPORTING ENERGY EFFICIENCY PROJECTS

Total Energy Savings	2013 Hospitals Implementing Energy Projects
Total savings (sum of group)	\$30.3 million
Savings in dollars/ square foot	\$0.21
Average % of total energy expenditure saved	5.0%
Total energy savings (sum of projects Implemented in kBtu)	531 million
Total GHG emissions prevented ¹ (in metrics tons CO ₂ equivalent)	81,000 CO ₂ e
Total savings over time since project implementation	\$1.0 billion
Total energy saved over time since of project implementation	1.8 billion kBtus

1) Please note, per U.S. EPA, most users of the Greenhouse Gas Equivalencies Calculator who seek conversion factors for electricity-related emissions want to know equivalencies for emissions reductions from energy efficiency or renewable energy programs. These programs are not generally assumed to affect baseload emissions (the emissions from power plants that run all the time), but rather non-baseload generation (power plants that are brought online as necessary to meet demand). The Greenhouse Gas Equivalencies Calculator uses the Emissions & Generation Resource Integrated Database (eGRID). The U.S. annual non-baseload CO₂ output emission rate to convert reductions of kilowatt-hours into avoided units of carbon dioxide emissions is: emission factor = 6.8956 x 10⁻⁴ metric tons CO₂ / kWh.

2013 Award-winning hospitals saved over \$30 million through energy efficiency and prevented the generation of 89,000 metric tons of CO₂ equivalents.

One key strategy for energy conservation is a continuous commissioning process. Hospitals that continuously track and trend their systems and the individual pieces of equipment tend to succeed in their efforts to reduce energy consumption. And with commissioning, there is often little capital outlay. Eighty-two percent of our hospital winners reported regular inspections as part of their commissioning process (**Table 56**). Clearly, there is a strong correlation between commissioning and the energy and cost savings that the hospitals have demonstrated.

TABLE 56: COMMISSIONING

Commissioning	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Incorporate regular inspections of the mechanical ventilation system into the commissioning program to identify if the filters are clean, not overloaded and without leaks or tears and insure that drip pans are free of standing water or other contaminants	82%	74%	88%	
Ensure that the commissioning program addresses —at a minimum—the following: heating system, cooling system, humidity control system, lighting system, safety systems, building envelope, domestic water pumping systems and the building automation controls	76%	63%	86%	
Other commissioning	29%	24%	34%	

Refrigerant management (**Table 60**) is another important responsibility of facility managers. Halogenated chloro-fluorocarbons (HCFCs) are a primary contributor to ozone depletion. Hospitals are making an increasing effort to help mitigate this contribution to ozone depletion. Learn more at EPA's guidance on [Phaseout of HCFCs](#).

TABLE 57: REFRIGERANT MANAGEMENT

Refrigerant Management	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Set up leakage minimization procedures and systems to meet annual leakage minimization standards and reporting requirements. (For more information, see U.S. EPA's "Complying with the Section 608 Refrigerant Recycling Rule.")	73%	66%	79%	
Use non-CFC-based HVAC&R equipment which is often more efficient than CFC-based equipment and can improve overall facility energy performance	69%	67%	72%	
When reusing existing HVAC systems, conduct an inventory to identify equipment that uses CFC refrigerants and provide a phase out schedule for these refrigerants	65%	54%	71%	





Tracking Water Use

Tracking and measuring the amount of direct water used is the first step a hospital should take to begin its water management and minimization program. The “water footprint” of a hospital is defined as the total volume of freshwater that is used to run and support the hospital. Whether a hospital leases or owns the building, it is imperative that it has accurate water tracking tools in place to identify underperforming buildings, verify efficiency improvements and prioritize investment opportunities. [ENERGY STAR’s Portfolio Manager](#) is a useful tool for hospitals to track their water consumption. Portfolio Manager is an online tool that can help hospitals track and assess energy and water consumption within individual buildings as well as across a health system’s building portfolio. A free water benchmarking tool called [Watermark!](#) is also available for use. This tool should prove helpful for many facilities interested in benchmarking their water use against like size and type facilities.

By tracking water use alongside energy use, facility managers can better understand how these resources relate to one another, make informed management decisions that increase overall efficiency, and verify savings from improvement projects in both energy and water systems. Organizations that manage water and energy performance together can take advantage of this relationship to create more efficient buildings.

2013

Hospitals are large water users in their communities. While the cost of water is relatively cheap in many regions, it is still a cost to hospitals and an important resource that should be managed responsibly. In some drought-prone areas, there is a greater incentive for the hospital to be a good community steward and minimize its water use to the extent possible.

Water consumption averages for this data set include:

- Hospital winners used nearly **7.5 billion gallons** of water
- Award winners spent nearly **\$62 million** on water and sewer fees
- Number of **operating rooms** was the **best predictor** of water consumption
- Average annual water use was **3.1 million gallons per OR**
- Average annual water use was **62 gallons per square foot**
- Best performers used **10 gallons per square foot** or less

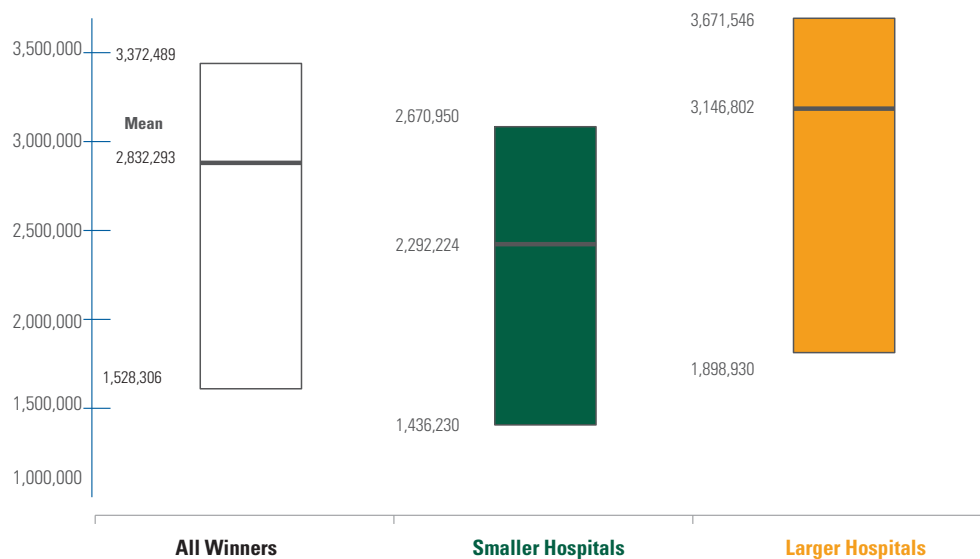
This year, the statistics show that the number of ORs was a good predictor of water use for the Award-winning hospitals. This could be due to high water use in the ORs and related activities, such as scrub sinks and Sterile Processing. However, the number of ORs might be an indicator of another factor that is *indirectly* related. One example is that hospitals that have more ORs may also be more likely to have onsite dialysis units, or other factors that use a lot of water that are not yet measured in this report.

While the costs per 1,000 gallons of water approximates the CBECS data reported below, the true cost of water “ownership” includes sewerage fees, included in the last row of Table 58.

TABLE 58: AVERAGE ANNUAL WATER USE AND COSTS

Water Use	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Total gallons used	7.5 billion	1.1 billion	5.8 billion	
Average annual gallons used per operating room	3.1 million	2.3 million	3.4 million	
Average annual gallons used per APD	391	351	391	
Water Expenditures				
Total annual water bill	\$41.9 million	\$5.8 million	\$26.6 million	
Total annual sewer bill	\$19.7 million	\$3.6 million	\$15.9 million	
Total combined water and sewer bill	\$61.7 million	\$9.4 million	\$42.5 million	
Average total cost per 1,000 gallons	\$5.59	\$5.27	\$4.58	
Average total cost per 1,000 gallon (water and sewer)	\$8.23	\$8.54	\$7.33	

FIGURE 13: AVERAGE ANNUAL WATER USE IN GALLONS PER OPERATING ROOM



Data for Comparison:

For the first time in its 30-year history, CBECS has collected and reported data on water use for a large set of hospitals. They reported that 3,040 large hospital buildings in the United States consumed an estimated 133 billion gallons of water in 2007 (data released in 2012), totaling \$615 million in water expenditures, with an average of 43.6 million gallons and \$202,200 per large hospital.

The overall consumption for this group of hospitals was an average of **67.7 gallons per square foot** for all hospitals over 200,000 square feet (per CBECS definition of large hospitals). Practice Greenhealth Award winners include hospitals less than 200,000 square feet, and water consumption averaged **62 gallons per square foot**.

The IFMA/ASHE/CES Benchmark Report 2.0 found that participating hospitals (all sizes) consumed an average of more than **70 gallons per square foot**.

While the data suggests that Practice Greenhealth hospitals outperformed these comparison hospital groups, it should be noted that the CBECS and the IFMA/ASHE/CHES benchmark data sets do not line up for easy comparison. Practice Greenhealth will be looking at ways to capture the data in 2014 that will allow for easier comparison to these other important sources of health care benchmarking information for energy and water use.

TABLE 59: COMMERCIAL BUILDINGS ENERGY CONSUMPTION SURVEY (CBECS) WATER CONSUMPTION INFORMATION

CBECS Water Consumption Information for Large Hospitals	Number of Hospital Buildings	WATER		
		Cost per Thousand Gallons (Dollars)	Gallons per Square foot	Gallons per Patient Bed (1000 Gallons)
All large hospitals*	3,040	4.64	67.7	144.8
Building floor space (Square Feet)				
200,001 to 500,000	1,494	4.95	78.0	118.5
500,001 to 1,000,000	1,034	4.80	69.1	149.1
Over 1,000,000	511	4.22	69.1	169.3

(SCBECS. "Table H8. Water Consumption Information for Large Hospitals, 2007." Released August 2012. Download for Table 8 is available at: <http://www.eia.gov/consumption/commercial/reports/2007/large-hospital.cfm>)

Award winners saved a total of 209 million gallons of water, or eight percent of their total usage, producing a savings of \$1.3 million.

Water Conservation

Despite awareness that water is one of the world’s most precious natural resources, program work on water conservation lags behind other sustainability projects—due in part to the disincentive low pricing of water per gallon. Hospitals continue to innovate in the water conservation arena; the data in this section of the report was provided by a total of 92 hospitals (half of the entire data set) and was contributed by 29 smaller hospitals and 63 larger hospitals. Larger hospitals (61 percent) were much more likely to implement water conservation projects than their smaller counterparts (35 percent). This could be due in part to the greater likelihood of large hospitals to have a stand-alone energy manager, in addition to a facilities director.

- Hospitals providing water conservation data **saved over 208 million gallons**—equal to an average of **eight percent of total water use**
- Financially, hospitals realized **\$1.3 million dollars in savings from avoided water use**

TABLE 60: AVERAGE ANNUAL WATER CONSERVATION SAVINGS

Water Conservation	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Engaged in recent water conservation projects	51%	35%	61%	
Gallons of water used annually (sum)	5.3 trillion	0.4 trillion	4.4 trillion	
Total gallons saved by project Implementation	209 million	38 million	168 million	
Average percent of annual water use conserved (calculated by facility then averaged)	8%	12%	6%	

Water Conservation	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Total water conserved in gallons per operating room	15.4 million	4.6 million	10.6 million	
Total water conserved in gallons per OR procedure	20,600	4,940	15,215	
Total water conserved in gallons per staffed bed	898,790	296,015	594,660	
Savings from Project Implementation				
Total dollars saved on water costs	\$1,322,330	\$114,465	\$1,207,865	
Average savings in dollars per operating room (for water and sewer)	\$2,280	\$1,897	\$2,461	
Average savings in dollars per OR procedure (for water and sewer)	\$3.70	\$2.58	\$4.24	
Average savings in dollars per staffed bed (for water and sewer)	\$141	\$144	\$139	
1) Data is for hospitals that reported conservation projects.				
2) This percent was calculated as an average of % savings for water of the individual facilities (gallons conserved / gallons used annually) for facilities that reported savings.				





XIV. TRANSPORTATION

Alternative Transportation

Many Award-winning hospitals and health systems have programs in place to reduce their transportation footprint. Almost all use teleconferencing to replace face-to-face meetings and well over half offer shuttle services to public transportation or between their own facilities.

More innovative techniques implemented in recent years include:

- 46 percent included **hybrid, electric or alternatively fueled** vehicles in their fleet
- 38 percent **reimburse public transportation fees** for employees
- 36 percent **provided desired parking** for carpools or hybrid cars

TABLE 61: ALTERNATIVE TRANSPORTATION TECHNIQUES

Alternative Transportation	All 2013 Hospitals	Smaller Hospitals	Larger Hospitals	Your Data
Encouraged teleconferencing instead of meetings	92%	96%	88%	
Offered shuttle services to/from public transportation and/or between facilities	57%	51%	61%	
Have hybrid, electric or alternative fueled vehicles in fleet	46%	37%	50%	
Reimbursed public transportation fees	38%	33%	40%	
Provided desired parking for carpools or owners of hybrid cars	36%	25%	48%	



5.0 CONCLUSIONS



Good Samaritan
Hospital

Good Samaritan Hospital
TriHealth

5.0 CONCLUSIONS

Summary of Savings

The 2013 Practice Greenhealth Sustainability Benchmark Report presents a snapshot in time of sustainability programs and activities that Practice Greenhealth Award-winning member hospitals are incorporating into their standard operating procedures. The health care sector has come a long way since hospitals first began cautiously piloting a few recycling programs and eliminating mercury thermometers. Today, hospitals are increasingly recognizing the value of sustainability programs as a benefit to the bottom line, a benefit to the health and wellness of their patients, visitors and employees, and an important leadership role for institutions that act as anchors in their communities. Together, Practice Greenhealth Award-winning hospitals have greatly reduced the environmental impact of providing patient care while creating a more engaged workforce who are (and should be) truly proud of their accomplishments in this arena.

Practice Greenhealth Award winners saved **nearly \$62 million dollars last year** through their sustainability activities and prevented the generation of **89 million tons of CO₂e**. **Table 67** presents a summary of savings achieved by the combined 2013 Award winners. Avoided greenhouse gas (GHG) emissions reported by our winners are also presented below Table 67. The amount of CO₂e reduced is equivalent to **removing 15,324 cars from the road or powering 12,100 homes for a year**. Other equivalencies are included below.

TABLE 62: SUMMARY OF SAVINGS

Savings From:	Waste Prevented 2011	Dollars Saved 2011	Waste Prevented 2012	Dollars Saved 2012	Waste Prevented 2013	Dollars Saved 2013	Table in 2013 Report
Recycling ¹	63,000 tons	\$19 million in avoided disposal fees	64,806 tons	\$16.8 million	94,930 tons	\$25.5 million	Calculations based on Table 12
SUD Reprocessing	320 tons	\$11.8 million	333 tons	\$18.3 million	680 tons	\$3.1 million	Table 21
Reusable Sharps Container Programs	1,625 tons	\$2.0 million	1,656 tons	\$794,000	2,065 tons	\$687,900	Table 23
Solvent Distillation	51,807 gal distilled 38,220 gal reused	\$860,000	39,507 gal distilled 37,725 gal reused	\$494,000	34,000 gallons	\$740,625	Table 33
Electricity (2011, 2012) Total Energy ² (2013)	50 million kWh =34,480 metric tons of CO ₂ e	\$8.5 million	72.5 million kWh =50,000 metric tons of CO ₂ e	\$16.8 million	533 million kBtu = 89,000 metric tons of CO ₂	\$30.3 million	Table 55
Water and Sewer	162 million gallons	\$610,000	150 million gallons	\$1.3 million	209 million gallons	\$1.3 million	Table 61
TOTAL		\$ 43 million		\$55 million		\$62 million	

CO₂e Emission Reductions

Award winners prevented the generation of 89,000 metric tons of CO₂e from the electricity savings listed above. The avoided GHG emissions are equivalent to any one of the following:

- Annual greenhouse gas emissions from **18,324 passenger vehicles**
- CO₂ emissions from **9.8 million gallons of gasoline consumed**
- CO₂ emissions from **504,550 barrels of oil consumed**
- CO₂ emissions from the **electricity use of 12,100 homes** for one year
- Carbon sequestered by **2,255,270 million tree seedlings** grown for 10 years
- Carbon sequestered annually by **72,095 acres** forests

Source and references used for these calculations include:

- U.S. EPA Clean Energy Website. Available at: <http://www.epa.gov/cleanenergy/>
- EPA Clean Energy Calculations and References. Available at: <http://www.epa.gov/cleanenergy/energy-resources/refs.html>
- EPA Greenhouse Gas Equivalencies Calculator (updated 2013). Available at: <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>

Summary

Practice Greenhealth Award winners lead the health care sector in driving sustainability performance improvement. Practice Greenhealth members continue to demonstrate that whether the institution is a tiny critical access hospital or a large urban academic medical center, there are sustainability strategies that can work in any health care environment—with site-specific modifications. There are a growing number of synergies between the identified sustainability strategies and other important health care priorities such as cost minimization, Lean process improvement, employee wellness and community benefit.

Each year, Practice Greenhealth member hospitals comment on how the Awards submission process has become an important part of assessing organizational progress on sustainability. And Practice Greenhealth hopes this Sustainability Benchmark Report will in turn become an important tool in developing the next year's sustainability strategies and goals. A thoughtful gap analysis process using the Benchmark data can highlight new areas of opportunity for consideration. For health systems, this data provides a place to begin a comparison of their system-wide performance—pushing all affiliated facilities to achieve a certain minimum level of performance in the focus areas they have selected. Practice Greenhealth takes pride in being the industry standard for comprehensive health care sustainability data, and takes this role very seriously. Practice Greenhealth will continue to do its best to align its metrics with other sustainability and industry standards for maximum comparability and information exchange.

Practice Greenhealth celebrates its Award winners and their many impressive accomplishments through this one-of-a-kind report and would like to thank each of the Award applicants who took the time to complete the lengthy application that provided the data for this report.

Practice Greenhealth would like to extend a special thank you to Andrea Brunk of Definitive Market Research, Inc. (DMR) who performed the statistical analyses. DMR is a woman-owned small business that employs experts in various fields, including economics, sociology, and demography. DMR's recent research studies include projects ranging from customer satisfaction, market segmentation, retention, market demand, and programming, to media awareness and efficiency.

As always, Practice Greenhealth welcomes your suggestions for ways in which this report could be improved. Please send any comments and suggestions to Lin Hill, Director of Awards at lhill@practicegreenhealth.org or Cecilia DeLoach Lynn, Director, Facility Engagement & Metrics at cdeLoach@practicegreenhealth.org.

DISCLAIMER: This report is based on self-reported data as provided by Practice Greenhealth Environmental Excellence Award applicants and has been compiled by staff and consultants. While the data is correct to the best of our knowledge, Practice Greenhealth cannot guarantee that all of the data presented herein is 100 percent accurate.



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