PRACTICE GREENHEALTH 2011 Sustainability Benchmark Report

A Practice Greenhealth Member Benefit



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Executive Summary

Moving up the Continuum: From Strategy to Performance

Sustainability in health care continues to have a profound effect on the sector and the communities they serve. Practice Greenhealth finds that many organizations are maturing in their sustainability practice, moving them up the continuum in many areas from strategy to daily performance. However, thorough and consistent tracking and reporting of sustainability efforts has not been widely available until recently. This third annual Sustainability Benchmark Report is the *only* report that shows comprehensive data illustrating the progress of sustainability across the health care sector.

Practice Greenhealth's 2011 Sustainability Benchmark Report presents current data and builds on the past two years of data to identify sustainability trends. The raw data for this report was supplied by Practice Greenhealth's Environmental Excellence Award applications for Partner for Change. The Partner for Change Award application includes three levels of Awards presented, namely Partner for Change, Partner for Change with Distinction, and Environmental Leadership Circle.

Why do Leadership Teams Need Benchmarking Data?

Organized information from peers can help teams assess the cost, quality, structure, comprehensiveness and success of their own sustainability programs; in this report they can easily assess their programs relative to other organizations and top performers in the sector. This can provide the requisite data and support needed to make comparisons, justify resources and identify opportunities and emerging areas of focus.

"It is critical to establish baseline and periodic sustainability performance data processes and review patterns for internal management and continuous process improvement. Access to comparative data, via tools like Practice Greenhealth's annual Sustainability Benchmarking Report, allows us to validate our data management processes, refine assumptions and identify sector best practices."

> ---Christina Vernon, AIA, LEED AP BD+C Sr. Director, Sustainability and Environmental Strategy Office for a Healthy Environment, Cleveland Clinic

Highlights of this Year's Study

New in 2011, the report includes an entire appendix full of histograms; diagrams that illustrate the distribution of data from individual hospitals (anonymously) and detail leadership in the community and health care sector. Additionally, Practice Greenhealth has highlighted exceptional performance that can help identify win-win strategies for successful implementation of sustainability in health care.

Compelling key findings include the aggregate measurable amounts of waste diverted or prevented and dollars saved in the following areas:

Savings From:	Amount of Waste Diverted or Prevented 2011	Dollars Saved 2011	Table in 2011 Report	
Recycling	63,000 tons	\$19 million in disposal fees ¹	_	
SUD Reprocessing	320 tons	\$11.75 million	Table 16	
Reusable Sharps Container Programs	1625 tons	\$2.0 million	Table 17	
Solvent Distillation	51,807 gal distilled 38,220 gal reused	\$860,000	Table 28	
Electricity	50 million kWh =34,480 metric tons CO_2^2	\$7.6 million	Table 46	
Natural Gas	116,400 dekatherms = 5,820 metric tons CO_2^2	\$925,000	Table 46	
Water	162 million gallons saved	\$610,000	Table 52	
TOTAL		\$43 million		

1) Recycling and diversion programs saved \$19 million in avoided solid and hazardous waste disposal fees. This data does not include additional savings from recycling construction and demolition debris.

2) The Greenhouse Gas Equivalencies Calculator can be found at http://www.epa.gov/cleanenergy/energy-resources/calculator. Energy efficiency 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 full report contains both big picture information and incredibly detailed data. The report presents specific data, both quantitative and qualitative, on how companies are emphasizing greener cleaners and environmentally preferable purchasing, reducing toxicity, providing healthier food options, creating savings from energy efficiency, and making progress in every area of sustainability in health care. Of particular interest is the data presented in the first section of the report, on sustainable programs implemented within the hospitals themselves, within their local communities and within the health care sector.

1.0 Introduction

Practice Greenhealth is proud to present our third annual Sustainability Benchmark Report, which illustrates the incredible steps our Environmental Excellence Award winners are taking toward becoming more sustainable organizations, decreasing their environmental footprint and improving the health care experience for staff, patients and guests alike. This report is designed to present both a snapshot in time of greening activities that U.S. and Canadian health care facilities are implementing today, and trends in data beginning in 2009. New this year are histograms to better visualize the results, and mathematical analyses of the data.

The report includes activities reported by winners of the Partner for Change (PFC), Partner for Change with Distinction (DIST) and Environmental Leadership Circle (ELC) Awards won in Practice Greenhealth's 2011 Environmental Excellence Awards Program. These Awards were presented at CleanMed 2011 in Phoenix, Arizona in April of 2011.

Since the Environmental Excellence Awards program inception in 2002, the sustainability movement in health care has grown and matured in many ways. The health care sector has moved beyond mercury elimination and solid waste reduction, and is evaluating every area in a hospital's operations to identify opportunities in improved environmental performance. Not surprisingly, the Award applications have grown along with the sector, and the current PFC/ELC Award application requires extensive reporting on waste and recycling data, environmentally preferable purchasing, greening the OR, specific program progress, and a host of other sustainable criteria. Thank you to all the staff who participated in the effort of completing these Award applications, the data from which makes this report possible.

This report includes data from the original Metrics Benchmark Report in 2009, our 2010 Sustainability Benchmark Report, and presents the new data from our 2011 Awards cycle. At Practice Greenhealth, we try to practice what we preach with continuous improvement. We change the Award applications a bit each year to improve our data collection; then strive to improve the Benchmark report each year to provide you with the data you really want to see. This year, our staff worked with a PhD. statistician at Dartmouth Hitchcock Medical Center and a PhD. mathematician from Ansys, Inc. to review the data and provide you with the best report possible. We have also included histograms in the report to better summarize the data visually.

Finally, this report has been re-designed for better flow of information; it still contains the data and tables from the 2011 PFC/ELC Award application form, but large sections are presented in a different order. We hope you will find the data herein informative and enlightening. Use this report to help set goals, compare against benchmarks and identify emerging trends.

Sincerely,

Lin Hill Director of Awards Practice Greenhealth

2.0 THE DATA SET

The following analyses have been done using data provided by the 118 PFC (83 PFC and 35 DIST) and 23 ELC Award winners from the 2011 Awards cycle. This group of winners includes primarily acute care hospitals, of all sizes located across the country. This year, long term care facilities and clinics have been removed from the data set, because their operations and waste streams are so different from that of acute care hospitals. In the future, we hope to have a report specifically for these types of facilities. The 2011 data set is slightly larger than the 2010 data set, and includes only hospitals.

A number of Award winners indicated that they are running far below their licensed bed numbers. On *average*, 2011 PFC winners reported staffing 87% of their licensed beds, but the range was large, from 36% to 100%, and ELC winners reported staffing 84% of their licensed beds, with a range of 53% to 100%. A visual representation of the data set and normalization factors can be found as histograms in Appendix 1 to the Report. As an example, a histogram of the distribution of adjusted patient days (APD) at the hospitals used in this report (along with a description of how to interpret the histograms) is provided in **Section IV. WASTE PROFILING: How to Interpret the Histograms**.

The 2011 PFC data set is quite broad in scope, and recognizes both PFC Award winners (facilities that range from just meeting the minimum criteria to having a well established environmental program) and PFC with DIST Award winners, (DIST includes facilities that are at the high end of the PFC Award range). The ELC winners are the hospitals that are leading the nation in health care sustainability. We have combined the PFC and DIST winners, but have separated out the ELC winners in the tables below, for comparison. When viewing the data, you can view the benchmark for engaged facilities (the PFCs and DISTs) and then compare the benchmark to our top performing hospitals. For more information on Award types, see www.practicegreenheatlh.org/awards.

Please note that all of the data contained in this report is taken directly from Award applications, and have been compiled and analyzed by staff and consultants. Practice Greenhealth cannot guarantee the accuracy of the data. The data is provided through the applications, and while some of it is documented, there is no certification of the accuracy of the data. As it is reviewed, unintentional errors are sometimes uncovered and corrected when possible, or removed, and outliers ten times the mean (average) were removed from the data set. Errors can also occur in data manipulation. However, overall, Practice Greenhealth feels the data presented in this report is adequately sound and represents the best sampling of actual sustainability benchmarks, specific activities, trends and identification of growth opportunities available anywhere in the sector today.

3.0 Data Analysis and Results

I. SUSTAINABILITY AND ENVIRONMENTAL INFRASTRUCTURE

Community Benefit Reporting

Not for profit hospitals are required to defend their not for profit status to the IRS. Through the IRS, Form 990 Schedule D, hospitals can list their community building activities. While only some environmental stewardship activities meet the current definition of community building activity, the form, in section 6, does offer a place to add additional information. Other environmental stewardship successes for the year can be placed in this section. This can be helpful in making the connection between environmental stewardship activities and community benefit. It is also a way to ensure that stewardship programming is included in the community benefit report. This vehicle helps to educate leadership, staff and the community on the connection between human health and environmental health and the critical role environmental stewardship plays in mission demonstration and the future of health care. In 2011, Practice Greenhealth noted an increase in the percent of PFC winners that prepare community benefit reports, and an increase in those that include sustainability activities in their reports. More ELC winners also prepared community benefits reports, but there was a slight decrease in the inclusion of sustainable activities reported by ELC winners.

Community Benefit Reporting	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
PFC winners who have won PFC previously	46%	64%	_	_
Facilities that are non-profit	90%	92 %	96%	100%
Facilities that prepare a community benefit report	81%	86%	92%	100%
Facilities that include sustainability activities in their community benefit report	50%	59%	79%	70%

Table 1: Community Benefit Reporting

In 2011 the data suggest an ever increasing awareness of sustainability on upper management's radar screen and a formalizing of their commitment to sustainability. The best environmental programs generally involve strong management commitment complete with resources needed, and broad departmental support. Sustainability can be about more than just a few successful projects, it can be about changing the culture and attitudes within a facility. Many facilities report that staff engagement was an outcome of environmental stewardship programs.

Given the current economic situation in the country, it is not surprising that hospitals are looking at costs and paybacks of potential or actual environmental projects. Nearly half of PFC and 58% of ELCs reported calculating a payback period for sustainability activities that have up-front costs. And 57% of PFCs and 58% of ELCs reported that the owners or shareholders of their facility have been presented with information on potential or actual return on investment (ROI) for sustainability activities or projects.

Table 2 is a new table in the report, which illustrates specific sustainable activities facilities have been using to garner awareness and support within their own hospital. Each column of numbers represents the percent of winners that reported performing a given activity in the past, and also whether they performed it in 2010. For example, 75% of PFC winners had shared sustainable activities with their senior leadership team and/or addressed board of directors previously, and 93% performed this activity in 2010; similarly, 87% of ELCs had shared sustainable activities with senior leadership team and/or addressed board of directors previously, and 100% had performed this activity in 2010, which is a pretty impressive number.

Sustainable Activities In-house	2011 PFC Winners (% performed previously/ % performed in 2010)	2011 ELC Winners (% performed previously/ % performed in 2010)
Shared sustainable activities with senior leadership team and/or address board of directors?	75 / 93	87 / 100
Developed an environmental commitment statement?	65 / 69	91 / 70
Integrated sustainability into at least one grand rounds event this year	39 / 49	43 / 65
Added language to job descriptions on our commitment to the environment and the role that each employee plays.	16/ 21	43 / 35
Added sustainability measures for leadership staff performance evaluations	25 / 34	35 / 35
Sent at least one green team member from each site to CleanMed for Award receipt	43 / 61	65 / 70
Developed, improved or advertised sustainability website or webpage on Intranet	47 / 64	61 / 74
Created videos on sustainability for in-house use	18 / 28	61 / 57
Held low or zero-waste picnic for employees	3 / 10	43 / 48
Include questions about sustainability program in employee engagement survey	4/7	17 / 30
Developed Strategic Plan around sustainability that identifies short, medium and long term goals.	45 / 63	35 / 83
Created a healing garden for patients and staff	46 / 43	61 / 70
Other (see Appendix 2)	29 / 32	30 / 43

Table 2: Sustainable Activities In-house

A list of "other" in-house sustainability activities is included in Appendix 2. Activities included innovative ideas, from establishing "green Mondays" when no office supplies may be delivered, to being a charter signatory and Leadership Circle Member of the American College and University Presidents Climate Commitment.

Table 3 shows progress in sustainability infrastructure within our Award winning facilities. The data strongly suggest that in order to have a successful environmental program, a facility must have an active Green Team with broad representation from many different departments within the facility. Eighty-four percent (84%) of PFC and fully 100% of ELC Award winning facilities (note the bold numbers in the first row of data) reported having broad based Green Teams. The most successful programs have clear support from leadership and a strong grass roots movement from the within the staff.

TREND: The data suggests that hospitals are coming to the conclusion that they need a full time sustainability officer. Because sustainability reaches every department with in a hospital, these responsibilities are tough to add to an already full time or even part time job. In one year, full time sustainability officers rose from 31% to 69% for PFCs and from 46% to 61% for ELCs. That's an impressive increase and illustrates a growing commitment from leadership.

Sustainability Infrastructure	2009 PFC Winners	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Have a "Green Team"	97%	96%	84%	96%	100%
Have a designated sustainability officer	33%	54%	57%	75%	61%
Have a full time sustainability officer	_	31%	69%	46%	61%
Have someone on staff who is responsible for sustainability within their job description (but not by title)	45%	38%	34%	38%	65%
Track their environmental improvement initiatives in the Joint Commission structure	52%	52%	39%	46%	48%
Provide new employee orientation on environmental initiatives	82%	78%	68%	75%	78%
Provide annual training on environmental initiatives	_	60%	61%	83%	83%
Clinicians involved in environmental programs? Nurses? Physicians?	95% 78% —	90% 86% 87%	89% 95% 79%	96% 96% 92%	100% 96% 100%
Calculated payback period for sustainability activities that have up-front costs	_	_	58%	_	48%
Owners or shareholders have been presented with information on potential or actual return on investment (ROI) for sustainability projects?	_	_	58%		57%

Table 3: Sustainability Infrastructure

Who's Who in Health Care Sustainability?

Because sustainability is so diverse and facilities are so complex, it is not surprising that one champion alone cannot green an entire hospital. It takes representatives from many departments throughout the facility to create a successful green team. The best green teams have broad representation from many departments throughout the hospital. **Table 4** below indicates which departments were represented on hospital green teams.

TREND: The data shows that the Award winning green teams are becoming even more diverse. Representation from almost all departments listed below grew between 2010 and 2011. All ELC green teams had representation from environmental services and materials management. Representation from environmental health and services (EHS) took a bit jump for PFCs. Also of note is the large increase in representation from communications and marketing on the green teams; facilities are recognizing the importance of publicizing their greening efforts.

"Other" departments included: pharmacy, laboratory, mission, IT, radiology, education, chaplain, OR, finance, design and construction, respiratory, community health, medical records, laundry, and Human Resources.

Department	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Environmental Services	96%	97%	96%	100%
Facilities	87%	96%	92%	91%
EH &S	39%	61%	50%	57%
Materials Management	88%	92%	88%	100%
Engineering	80%	86%	63%	78%
Safety	78%	79%	71%	70%
Administration	86%	86%	67%	83%
Nutrition	72%	81%	50%	83%
Nursing	90%	92%	83%	91%
Infection control	46%	50%	46%	48%
Physicians	34%	45%	33%	35%
Communications/Marketing	65%	81%	58%	74%
Food Services	87%	90%	79%	96%
Risk Management	26%	25%	25%	22%
Other (see Appendix 2)	53%	53%	54%	83%

Table 4: Departmental Representation on Green Teams

II. A CULTURE OF SUSTAINABILITY

Table 2, Sustainable Activities In-House, above, reported on hospitals' activities to spread sustainability within their own organizations. **Table 5** illustrates hospitals specific activities to share sustainability within their own community, while **Table 6** illustrates hospitals' specific activities to spread sustainability throughout the health care sector.

Leadership within the Local Community (performed previously or in 2010)	% 2011 PFC Winners (performed previously)	% 2011 PFC Winners (in 2010)	% 2011 ELC Winners (performed previously)	% 2011 ELC Winners (in 2010)
Held thermometer swap	13	4	35	9
Held pharmaceutical take-back event	18	18	17	39
Held electronics collection event	19	28	22	26
Handed out or collected CFLs	11	19	35	17
Held Earth Day Event for patients and staff	71	81	91	83
Created a sustainability report as part of the community benefits report	29	39	57	65
Developed a sustainability webpage for the public on facility website	24	38	43	52
Display signage visible to patients describing recycling or other environmental programs; please upload at the bottom of this page if possible	0	0	90	95
Used local media to communicate sustainability activities to the community Performed previously	45	60	78	74
Received media attention /local press around PGH Award	21	29	74	83
Met with city government reps or local organizations to promote sustainability locally or plan local even (like Clean Air days)	33	44	87	83
Shared information on our sustainability programs with local businesses, community groups, schools etc.	45	57	87	96
Educated community on environmental topics (example: provide information on proper medication disposal when issuing prescriptions)	35	46	74	78
Include sustainability in advertising campaigns	15	20	35	39
Widely announce PGH membership to employees and/or visitors (beyond just hanging your Award plaque)	36	55	87	83
Other (see Appendix 2)	11	19	48	35

"Other" activities included: worked with local MRF to develop confidential document destruction program and financed shredder for the MRF; presented a regional webinar with other partners which included sections of community gardening education and resources in creating a greener footprint: past winner of US EPA Brownsfield Program Award for Community Impact—constructed an environmentally progressive health care laundry facility, in collaboration with the City local neighborhood association, which brought 100 jobs to a blighted urban area (many of the employees can walk to work, versus a 30 mile commute at the original laundry location); held a Nike "ReUse a Shoe" collection during Earth Day event; changed waiting message for patients to include details of the sustainability program and the Leadership Circle Award; spoke on sustainability at county board/village town hall events; and teamed up with local grade school for Earth Day, including student skits on RRR and presentation by hospital staff. For more ideas, see Appendix 2.

Sustainability in the Health Care Sector (performed previously or in 2010)	% of 2011 PFC Winners (performed previously)	% of 2011 PFC Winners (in 2010)	% of 2011 ELC Winners (performed previously)	% of 2011 ELC Winners (in 2010)
Presented at a state-wide Meeting	28	41	91	78
Presented at a national meeting (ASHES, ASHE, CleanMed,)	25	34	74	48
Presented at a Health System meeting	42	58	78	83
Performed mentoring to another hospital within our health system	45	63	74	74
Performed mentoring to another hospital outside our health system	29	53	83	83
Was interviewed by local TV or Radio for broadcast	17	31	65	57
Signed onto Healthier Hospitals Initiative's™ Healthier Hospital Agenda (www. healthierhospitals.org)	8	19	4	26
Engaged in socially responsible investing	16	27	17	17

Table 6: Leadership in the Health Care Sector

"Other" activities in the Health Care Sector included: worked with local university on sustainability "lunch and learn" for small businesses in local area; Hosted a workshop for other hospitals throughout the country that are working toward Baldrige Quality Programs; coordinated work between our hospital and two local colleges to establish a viable kitchen waste composting program; Presented at AORN Congress; are national pilot site for clinical plastics recycling; collaborated with local college on a Green Design conference and full weekend event; charter member of the Built Environment Network (a new program of the Center for Health Care Design); submitted and won USDA grant proposal to support local food effort; and Received the Mayor's Beautification Award for 2010 for both internal and external design for our new cancer center, due primarily to the environmental aspects of the building and the green roof. See Appendix 2 for a full list of "other" activities implemented.

III. NORMALIZATION OF DATA

Data must be "normalized" in order to compare metrics among facilities or even for measuring one's own progress. No two hospitals are exactly alike and will vary in many ways, including: terms of services provided, number of staffed beds and outpatient activity, whether they are a teaching institution, if have research labs, which state regulations they are operating under, the number of babies delivered, the number of surgical suites, the culture within the organization, and numerous other factors. In addition, each hospital will vary in how busy they are from year to year. Thus, we need to be able to normalize the data to make accurate comparisons.

For example, if a hospital has reduced one of its waste streams, it needs to be able to determine if the decrease was due to implementation of a new waste minimization program, or if the hospital was just a lot less busy than the year prior. But how does a facility best measure how busy they are? The answer is normalization factors and the best of these factors takes into account both inpatient and outpatient activity. In addition, a facility needs to note special activities, since Earth Day clean-ups, renovations, or Joint Commission preparation that can all lead to a spike in waste generation.

Derek C Hill, PhD, of Ansys, Inc. using dominant component analysis, suggests that the best hospital waste prediction is done using more than one normalization factor. There is no silver bullet, even using APD, to perfectly correlate waste generation. Practice Greenhealth attempts various methods of normalizing to aid in flexibility in comparisons.

Below are normalizing factors commonly found in health care, a description of how it is determined and some pros and cons of the particular factor.

• Adjusted Patient Days: Some variation of adjusted patient days (which takes into account inpatient and outpatient activity) is often a very good normalization factor. Many hospitals use adjusted patient days (APD), which are generally calculated as:

APD = (Total Patient Days)*(Total Patient Revenue/Inpatient Revenue); where total patient revenue = inpatient + outpatient revenue.

- **Beds or Patient Days:** Many hospitals use daily beds or patient/inpatient days to track internal activity. These types of normalization factors change daily. While "staffed beds" is a more accurate normalization factor than "licensed beds," by definition it changes daily, which makes it harder to obtain and use; licensed beds remain constant, which increases ease of use, but often exceeds more "real" staffed bed numbers. Practice Greenhealth uses staffed beds for ease of your comparison in this report, but remember to note that it does not take into account outpatient activity.
- **Employees:** Practice Greenhealth uses the term "full time equivalents" or "FTEs" in the report to designate the number of staff at a facility; this is a good normalization factor because it takes into account inpatient and outpatient staff. It is also a number that every facility can easily determine. Practice Greenhealth uses this factor in the waste analyses.
- **Outpatient visits:** For facilities that have a lot of clinics, outpatient visits may be a useful number to use. Clinics and university hospitals generally have a higher proportion of outpatient visits than a typical hospital. However, since there is no accounting for inpatient activity in these numbers, using outpatient visits alone to normalize hospital waste data does not provide very useful information. Practice Greenhealth will not be using these numbers for normalization in this report.

- **Operating Rooms:** For some of the waste generated, such as Regulated Medical Waste, the number of operating rooms could be a good normalizing factor. Practice Greenhealth requested the number of operating rooms currently in service at each facility.
- **Square Footage:** Square feet can be an excellent normalization factor when looking at energy data. Square footage also indirectly takes into account inpatient and outpatient activity.

In past Benchmark reports, Practice Greenhealth has relied primarily on adjusted patient days as our normalization factor of choice, since this number accounts for both inpatient and outpatient activity. This report will also use other normalization factors, because some normalization factors are better correlated with some waste streams, and not all hospitals use or report APD.

There are a number of tables within this report that use percentage of the data set to report data; for example percent of applicants participating in a specific greening activity. This helps to trend sustainability activities in the sector and does not require any normalization factors.

IV. WASTE PROFILING

How to Interpret the Data Tables

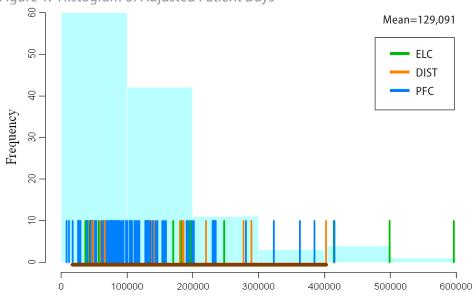
In the tables herein, we reported PFC data from the 2009 Metrics Benchmark Report. We did not have data for the ELC members in that report because they were, at that time, filling out a different Award application. The 2009 Award application was much shorter, so many of the tables do not have 2009 data. In 2010 and 2011, Practice Greenhealth combined the Partner for Change (PFC) and Partner for Change *with Distinction* (DIST) Awards data for ease of representation in the tables to compare to the top performing ELC hospitals. However the three Award types *are* represented in the histograms below and in Appendix 1 by color. In addition, there are some new tables from the 2011 Award application that will only show 2011 data.

How to Interpret the Histograms

Histograms are a graphical method to represent the distribution of data. Typically, a histogram divides the range of the data (from minimum to maximum) into equal width "bins" and displays the number of data points within each bin as a rectangle; the height of the rectangle equals the frequency, or number of occurrences.

For example in the Adjusted Patient Days (APD) histogram immediately below, there are 60 hospitals with APD < 100,000 (left most rectangle), 40 hospitals with APD between 100,000 and 200,000 (second rectangle) and only ten hospitals with APD between 200,000 and 300,000 (third rectangle). The individual hospitals are represented anonymously by Award type, with blue lines denoting PFC winners, orange lines denoting DIST winners and green lines denoting ELC winners.

The mean, or average, value for the entire data set is represented above the color key; in the example the mean is 129,091 APD. The underlying brown segment just above the X axis (horizontal axis) represents 95% of the data (2.5% to the left and 97.5% to the right). Hospitals outside 95% interval can be considered outliers.





Waste and Recycling Data – the traditional method

Table 7 illustrates waste generation by type of waste as a percentage of <u>total</u> waste stream (or "what percent of a hospital's waste is solid waste, recycling, Regulated Medical Waste (RMW) or hazardous waste?"). Because each waste stream is presented as an average percentage of a facility's <u>total</u> waste stream, no normalization factors are necessary. In Table 7, waste percentages are presented as Practice Greenhealth has traditionally done it, with "Reduce, Reuse Recycle" including items that are traditional recycling (glass bottles, aluminum cans) and waste that is prevented (weight that was previously created, like the weight of Styrofoam waste from the cafeteria) and waste that was diverted from the landfill (reusable sharps containers).

Table 7 reads: from 2009 to 2011, PFC winners reduced their average solid waste generation from 68% to 64%, and increased their recycling from 24% to 25.5%. RMW generation rose slightly for PFC winners, from 8 to 9% and hazardous waste remained at less than 1%.

	Average % of Total Waste Stream					
Waste Type	2009 PFC Winners	2010 ELC Winners	2011 ELC Winners			
Solid ¹	68%	66%	64%	56%	56%	
RRR ²	24%	24%	25.5%	36%	38%	
RMW	8%	9%	9%	7%	5%	
Hazardous ³	<1% (0.46)	1% (1.1)	0.5%	1% (0.6)	1% (0.9)	

Table 7: Waste Distribution as % of Total Waste Stream

1) Some of the **solid waste** numbers may contain treated **RMW** (e.g. when treated onsite by autoclave before being land filled), which drives the solid waste percentages up and the RMW percentages down.

2) The Reduce, Reuse, Recycle numbers includes recycling and prevented or diverted waste.

3) 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.

Pie charts (Figures 2 and 3) represent the data in Table 7 as follows:

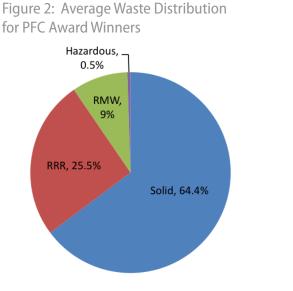
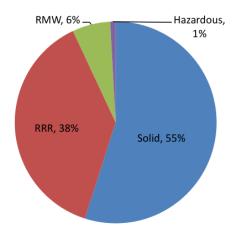


Figure 3: Average Waste Distribution for ELC Award Winners



Total Waste and Recycling Data – the New Method

Total waste is solid waste or municipal waste, recycling material, regulated or red bag waste and hazardous waste, as defined by EPA's Resource conservation and recovery act.

In the past, hospitals (and analyses performed by Practice Greenhealth) have generally combined anything that fits into the "Reduce, Reuse, Recycle" definition into "recycling" data. This included waste that was traditionally recycled (like glass bottles and aluminum cans) and waste that was prevented or diverted from the landfill (E.G. the tons of waste that were *not created after switching to reusable* service ware in the cafeteria, or reusable pallets). Often this number included data that was estimated, not weighted or even calculated from a sample weight, such as tons of hospital equipment donated or weight of grass clippings not sent to the landfill. Generally these "diverted" tons would also show up as decreased solid waste generation.

Practice Greenhealth is beginning to evaluate and standardize "recycling" from "waste diversion." Practice Greenhealth would like to give "credit" for the diverted waste but feels that it needs to be separated from the "recycling" data. The advantage of this is that you don't need to worry about how different facilities are estimating the weight of diverted waste, and the hospitals don't have to worry about how long to "count" the weight of a diverted waste stream that they haven't had for ten years (E.G. "we switched to reusable dishware in 2001, how many tons of polystyrene did we used to dispose of...?). By using normalizing factors such as total waste per FTE (full time employees) or total waste per adjusted patient day, it is possible to recognize and acknowledge waste prevention activities without also weighing or otherwise measuring the material that is diverted indefinitely.

Practice Greenhealth fully acknowledges that diversion is true source reduction, and should be celebrated as preferred over recycling because diversion prevents waste upstream, before it is created. This is our ultimate goal. In the future, Practice Greenhealth will explore using recycling data for waste percentage evaluation instead of the total RRR number; Practice Greenhealth has determined that this technique provides a more accurate representation of waste distribution.

In **Figures 4 and 5** the waste stream percentages are presented with Recycling data instead of RRR data, and have omitted the minimal hazardous waste data, for simplicity sake. The percentages are not as different as one might think (compare to the pie charts immediately above).

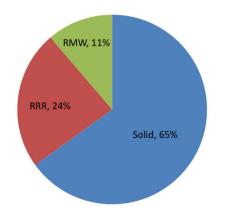
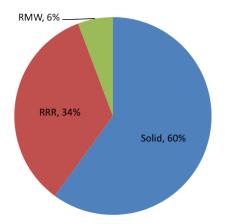


Figure 4: Waste Distribution for PFC with Recycling but no Diversion (New Method)

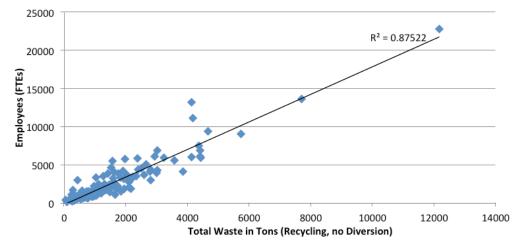
Figure 5: Waste Distribution for ELC with Recycling but no Diversion (New Method)



Normalized waste data

Scatter plots were used to evaluate how well some normalization factors correlate to the data. An R² value is a way to gauge how well the data correlates to a specific normalization factor; an R² value of 1.0 would show that there is a perfect correlation between the data and the normalization factor. Figure 6 illustrates how well "Total Waste" generation correlates to the number of employees, as measured in full time equivalents (FTEs). Total waste in this plot includes recycling but excludes diversion. This plot shows an excellent correlation between the total waste and FTEs, with an R² value of 0.875. FTEs is a good normalization factor because it includes employees that service both inpatient and outpatient clients. The second best correlation to total waste was pounds per square footage of the facility, (which gave an R² value of 0.834) and the third best correlation was APD, with a R² value of 0.727. These three normalization factors all include inpatient and outpatient activity.





Using either FTEs or square footage, ELCs out-performed the PFCs. As stated above, there is no silver bullet for analyzing hospital data, but you can try and pick a normalization factor that correlates best with your data and makes the most sense. See Appendix 1 for more scatter plots.

Table 8: Total An	inual Waste Generat	ion Normalized b	by Different Factors
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Total Waste (Recycling, no Diversion)	2011 PFC Winners	2011 ELC Winners
Pounds / FTE	1302	1207
Pounds / Square Foot	3.8	3.3
Pounds/ APD	25.1	25.1
Tons / Staffed bed	4.8	5.0
Pounds / Staffed Bed / day	26.1	26.3

Waste generation normalized by Adjusted Patient Day

As mentioned above, adjusted patient days is often a good normalization factor because it is based on both inpatient and outpatient activity. **Table 9** illustrates that in 2009, PFC winners generated 16.0 pounds of solid waste per APD; and 16.9 pounds per APD in 2010 and 2011; ELC winners also increased their solid waste generation from 13.3 pounds per APD in 2010 to 15.0 pounds per APD in 2011.

From 2009 to 2011, generation of all waste types increased slightly, as measured by pounds per APD. An increase in recycling and diversion is desirable, and an increase in hazardous waste may be due to better identification and proper disposal of hazardous pharmaceutical waste.

Please see Histograms of Waste Generation in Appendix 1.

TREND: Increases were noted in most waste and recycling categories for PFC and ELC.

Table 9: Waste generation normalized by Adjusted Patient Day

Waste Type	Average lbs. per APD ¹ for 2009 PFC Winners	Average lbs. per APD ¹ for 2010 PFC Winners	Average lbs. per APD ¹ for 2011 PFC Winners	Average lbs. per APD ¹ for 2010 ELC Winners	Average lbs. per APD ¹ for 2011 ELC Winners		
Solid Waste	16.0	16.9	16.9	13.3	15.0		
Recycling ²	5.6	5.7	7.2	8.6	10.2		
RMW ³	1.9	1.9	2.6	1.6	1.5		
Hazardous Waste ⁴	Hazardous Waste ⁴ 0.14 0.19 0.13 0.20						
 Adjusted Patient Days = Total Patient Days x (Total Patient Revenue/Inpatient Revenue) Where Total Patient Revenue = Inpatient Revenue + Outpatient Revenue RRR includes recycling, diversion and universal waste. RMW includes regulated medical waste and non-hazardous pharmaceutical waste. Hazardous waste includes RCRA-regulated pharmaceutical waste 							

More detail is provided for Regulated Medical Waste Generation in **Table 10** below, looking at different normalization factors.

Table 10: Regulated Medical Waste Generation

RMW Generation	2011 PFC Winners	2011 ELC Winners
Average Pounds RMW per APD	2.6	1.5
Average Tons per Staffed Bed	0.5	0.3
Average Pounds per FTE	141	71
Average Pounds per square Foot	0.4	0.2
Average Tons RMW per O.R.	10.3	4.9

V. COSTS AND VOLUMES OF HEALTH CARE WASTE STREAMS

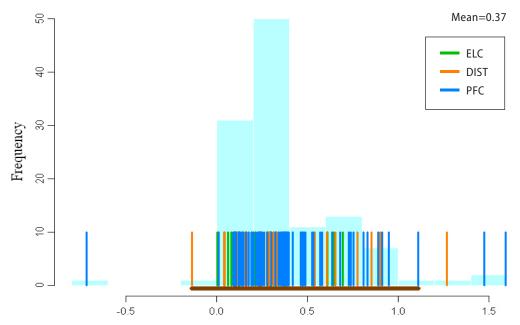
Table 11 presents average costs of waste disposal across the country. A visual representation of the cost of each waste type can be seen in histograms in Appendix 1. The data in this table is for total annual disposal costs, which is often more than just price per pound.

Table 11: Costs of Waste Streams for PFC an	d ELC Winners
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Waste Stream	Solid Waste Cost per <u>Ton</u>	Recycled Cost per <u>Ton</u> ¹	RMW Cost per <u>Ton</u> ²	Hazardous Waste Cost per <u>Pound</u> ³		
Average of all PFC and ELC winners	\$126	\$90	\$1015	\$3.1 (\$6200/ton)		
1) RRR includes recycling, diversion and universal waste; 2) RMW includes regulated medical waste and non-hazardous pharmaceutical waste; 3) Hazardous waste includes RCRA regulated pharmaceutical waste.						

The total annual waste cost per square foot for PFC, DIST and ELC Award winners averaged \$0.37 per square foot. Total annual waste cost per square foot is displayed in the histogram below; a negative number indicates that the hospital's recycling revenue covered their entire waste disposal costs (generally this is accomplished by including Single Use Device Reprocessing savings).

Figure 7: Histogram of Total Annual Waste Costs per Square Foot



VI. SOLID WASTE: REDUCE, REUSE, RECYCLE

Table 12 summarizes donations health care facilities made to third world countries and otherneedy hospitals through non-profit organizations. The biggest jump in donations was seenin linens for the ELC group. This benefits the recipients and keeps waste out of solid wastelandfills. For an excellent discussion of the complex issues around donations to the third world,such as donating what is really needed, see the recent Catholic Health Association (CHA) reporttitled CHA Medical Surplus Donation Study.

Donated item	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Clinical Items	62%	77%	88%	83%
Medical Equipment	68%	77%	88%	87%
Furniture	59%	64%	83%	78%
Computers	42%	40%	58%	52%
Linens	25%	22%	46%	70%
Books	20%	32%	33%	35%
Other Supplies	32%	38%	38%	52%

Table 12: Donations

Recycling

Reporting on Appendix A of the Partner for Change Application, "Recycled Materials":

In 2011 Award winners reported recycling or diverting 63,000 tons of materials (equivalent to over 126 million pounds) from their waste streams. These recycling and diversion programs saved \$19 million in avoided solid and hazardous waste disposal costs. However, given extra costs and current recycling rates, a recycling program may cost more than it saves. This data does not include additional savings from recycling construction and demolition debris.

Table 13 presents a list of materials recycled as reported in the application, organized from the highest to lowest occurrence based on PFC recycling efforts. In other words, the materials are ranked from the most to the least recycled items. Both single-stream and co-mingled recycling are listed separately in the tables below, because, as we understand it, both recycling types generally combine glass, plastic and aluminum, but single-stream recycling also includes paper. So are facilities making or losing money on recyclables? To find out, Practice Greenhealth analyzed data from the 12 ELC facilities that reported recycling cost information.

The top five most highly recycled materials in 2011 were batteries, fluorescent lamps, computers/electronics, mixed paper, cardboard and cooking oil. This data highlight the efforts hospitals are making to segregate their Universal Wastes in order to reduce their hazardous waste stream and associated costs.

TREND: Co-mingled and Single-stream recycling both increased, with roughly twice as many facilities reporting co-mingled recycling as compared to single stream. The trend is to make recycling easier for patients and staff, in an effort to simplify logistics and increase the percent of waste recycled.

TREND: In 2010, half of the ELC hospitals reported making money on their recycling programs but by 2011, only seven of the 23 ELC winners reported making a profit and one reported breaking even.

Recycled Materials	% of 2009 PFC winners	% of 2010 PFC winners	% of 2011 PFC winners	% of 2010 ELC winners	% of 2011 ELC winners
Batteries	90	90	87	92	100
Fluorescent lamps	92	88	82	92	100
Computers/Electronics	82	80	81	92	100
Paper, mixed	75	84	75	92	100
Co-mingled Recycling	_	63	71	71	87
Cardboard	92	1	70	1	91
Oil (cooking)	<782	73	70	75	91
Ink jet and Toner Cartridges (formerly separate)	_		66		78
Equipment Donation	70	69	64	75	74
Paper, white	78	61	60	79	65
Reusable sharps containers	25 ³	53	59	67	78
SUD Reprocessing	223	56	57	75	83
Cans, Aluminum	65	69	55	75	83
Medical Supplies Donation	_	_	51		70
Pallets	7	70	51	79	83
Blue Wrap	12	34	46	58	70
Newspaper	58	57	44	83	65
Plastic, #1PET	40	41	44	67	65
Plastic, #2 HDPE	40	42	43	63	52
Glass, clear	33	39	42	50	57
Oil (motor)	<782	46	42	71	83
Glass, mixed	27	41	39	58	65
Cans, Steel	47	51	37	75	78
Plastic, mixed	57	46	37	58	70
Boxboard	20	40	36	67	65
Glass, colored	28	33	36	42	43
Steel (listed as steel cans in 2009)	47	47	36	88	74
Single Stream Recycling		32	33	25	43
Food waste (composting)	17	25	32	71	74
Linens (reused for rags only)	47	37	31	46	52
Plastic, #5 polypropylene	27	31	31	50	65

Table 13: Recycled Materials Sorted by Occurrence (highest to lowest)

Recycled Materials	% of 2009 PFC winners	% of 2010 PFC winners	% of 2011 PFC winners	% of 2010 ELC winners	% of 2011 ELC winners
Shrink wrap	22	28	31	38	57
Solvent distillation	38	30	31	67	61
Food donation	33	24	29	42	61
X-ray film	37	27	27	58	61
Foam peanuts	28	26	25	58	61
Plastic, #6 PS	28	29	25	46	57
Wood	17	24	25	50	48
Landscape (composting)	28	25	24	67	43
Ice packs/coolers	22	20	23	58	43
Ink jet cartridges	50	63	_	67	_
Toner cartridges	82	75	_	71	_
Other	33	34	23	54	43

1) There was an error on the 2010 Appendix A application which would not allow data to be entered for cardboard.

2) Cooking oil and motor oil were combined in the 2009 application.

3) The data reported in Appendix A for SUDs and reusable sharps in 2009 was much lower than reported in the RMW section of the applications.

The same recycling information is presented in Table 14, but the data is shown sorted **alphabetically**.

TREND: Blue wrap recycling continues to grow as hospitals find vendors who will accept the material.

Table 14:	Recycled	Materials	Sorted	Alphabetically
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Material Recycled	% of 2009 PFC winners	% of 2010 PFC winners	% of 2011 PFC winners	% of 2010 ELC winners	% of 2011 ELC winners
Batteries	90	90	87	92	100
Blue Wrap	12	34	46	58	70
Boxboard	20	40	36	67	65
Cans, Aluminum	65	69	55	75	83
Cans, Steel	47	51	37	75	78
Cardboard	92	1	70	1	91
Co-mingled Recycling		63	71	71	87
Computers/Electronics	82	80	81	92	100
Equipment Donation	70	69	64	75	74
Fluorescent lamps	92	88	82	92	100
Foam peanuts	28	26	25	58	61
Food donation	33	24	29	42	61
Food waste (composting)	17	25	32	71	74
Glass, clear	33	39	42	50	57
Glass, colored	28	33	36	42	43

Material Recycled	% of 2009 PFC winners	% of 2010 PFC winners	% of 2011 PFC winners	% of 2010 ELC winners	% of 2011 ELC winners
Glass, mixed	27	41	39	58	65
Ice packs/coolers	22	20	23	58	43
Ink jet cartridges	50	63	_	67	_
Ink jet and Toner Cartridges (formerly separate)	_		66		78
Landscape (composting)	28	25	24	67	43
Linens (reused for rags only)	47	37	31	46	52
Medical Supplies Donation	_	_	51		70
Newspaper	58	57	44	83	65
Oil (cooking)	<782	73	70	75	91
Oil (motor)	<782	46	42	71	83
Pallets	7	70	51	79	83
Paper, mixed	75	84	75	92	100
Paper, white	78	61	60	79	65
Plastic, #1PET	40	41	44	67	65
Plastic, #2 HDPE	40	42	43	63	52
Plastic, #5 polypropylene	27	31	31	50	65
Plastic, #6 PS	28	29	25	46	57
Plastic, mixed	57	46	37	58	70
Reusable sharps containers	25 ³	53	59	67	78
Shrink wrap	22	28	31	38	57
Single Stream Recycling	_	32	33	25	43
SUD Reprocessing	223	56	57	75	83
Solvent distillation	38	30	31	67	61
Steel (listed as steel cans in 2009)	47	47	36	88	74
Toner cartridges	82	75	_	71	_
Wood	17	24	25	50	48
X-ray film	37	27	27	58	61
Other	33	34	23	54	43

1) There was in input error in the application; no data could be entered on some applications.

2) 2009 PFC oil recycling numbers were combined for cooking and motor oil.

3) The data reported in Appendix A for SUDs and reusable sharps is much lower than reported in the RMW section of the applications.

VII. REGULATED MEDICAL WASTE REDUCTION (RMW)

Table 15 illustrates the use of specific RMW reduction techniques, while Tables 16 and 17 present data on savings and waste avoidance from Single Use Device Reprocessing and Reusable Sharps Container programs.

TREND: For the last three years in a row, every area of RMW reduction has held steady or increased for the PFC Award winners. Single Use Device Reprocessing, Reusable Sharps Containers, and Fluid Management in the OR (and not just in the orthopedic ORs) have all seen steady increases. Practice Greenhealth is proud to report that for the second year in a row, all of our ELC winners have engaged in RMW education and reduction programs, and 96% are using single use device reprocessing and fluid management in the ORs.

Table 15: RMW Reduction Techniques

These facilities reported that they:	2009 PFC Winners	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Have engaged in an RMW education and reduction program	82%	78%	81%	100%	100%
Have posted waste segregation posters at red bag collection areas	_	73%	76%	92%	96%
Use a Fluid Management system in the OR	47%	50%	59%	79%	96%
Use the fluid management system exclusively in orthopedic ORs		11%	10%	38%	17%
Use Single Use Device reprocessing	68%	74%	79 %	92%	96 %
Have implemented a Reusable Sharps Container program	57%	58%	65%	75%	74%

Single Use Device Reprocessing and Reusable Sharps Container Programs

In 2010, the data for this section was taken from narratives provided by PFC and ELC Award winners. In 2011, space was provided for quantification of waste prevented and savings generated from Single Use Device Reprocessing (SUDs) and Reusable Sharps Container programs. Summary data is presented in **Tables 16 and 17**.

Practice Greenhealth strongly encourages the use of these and other RMW reduction techniques in conjunction with Greening the OR[™] and other solid waste reduction activities. Through SUD reprocessing, our PFC and ELC winners saved over **\$11,750,000** and diverted over **320 tons** of waste from entering the RMW or solid waste stream. Our winners saved an additional **\$2 million** and diverted **1625 tons** of waste through Reusable Sharps Container programs. Other benefits from reusable sharps container programs may include reduced incidents of overfilled containers and associated worker exposure risk, reduced staff time, and fewer staff handling sharps containers.

Implementation of these programs at any facility may yield different results than the averages presented below, but some savings and reduction in waste can be expected, and can be predicted more accurately by vendors.

Table 16: Single-Use Device Reprocessing

SUD Reprocessing	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Total Annual Savings (sum of facilities)	\$6,409,500	\$8,061,045	\$4,426,700	\$3,690,360
Average Annual savings per staffed bed (approx.)	\$500/bed	\$440	\$750/bed	\$775
Average Annual savings per APD	\$ 1.40	\$1.40	\$ 3.51	\$2.10
Average Annual savings per O.R.		\$9,435		\$11,980
Tons of waste diverted annually from landfill (sum all facilities)	38 Tons	258	41 Tons	63
Average annual lbs. of waste diverted from landfill per staffed bed	16 #/bed	26	21 #/bed	24
Average Annual pounds of waste diverted per APD	0.040	0.1	0.046	0.1
Average Annual pounds of waste diverted per O.R.		395		424

Table 17: Reusable Sharps Container Program Savings

Reusable Sharps Containers	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Total Annual Savings (sum of facilities)	\$1,351,450	\$1,685,180	\$503,950	\$352,020
Average Annual Savings per staffed bed	\$140	\$98	\$92	\$103
Average Annual savings per APD	\$ 0.41	\$0.40	\$ 0.35	\$0.24
Tons of waste diverted annually from landfill (sum all facilities)	640 tons	1345 tons	70 tons	280 tons
Average Annual pounds of Waste diverted per staffed bed	145# per bed	142# per bed	88# per bed	125# per bed
Average Annual pounds of waste diverted per APD	0.46	0.4	0.28	0.3

Reporting on Appendix B of the Partner for Change Application, "Single Use Device (SUD) Reprocessing"

The 2010 Award application's Appendix B was our first attempt to capture what type of SUDs are most commonly reprocessed. The 2011 table also reports the percentage of facilities that are reprocessing these items but also includes the percent of facilities purchasing these reprocessed items.

TREND: The items most commonly reprocessed were: orthopedic burrs and bits, and, in general surgery, pneumatic cuffs and ultrasonic scalpels.

Table 18a: SUD Reprocessing - PFCs

Device	% of 2010 PFC winners reprocess these items	% of 2011 PFC winners reprocess these items	% of 2011 PFC winners purchase these reprocessed items
ANESTHESIOLOGY			
Anesthesia Masks	7	2	2
Laryngeal Airway	11	5	3
Pulse Oximeter Sensor	33	46	40
CARDIOVASCULAR			
Pericardiocentesis Tray	4	1	1
Tissue Stabilizer	4	4	3
Blood-Pressure Cuff	18	22	15
Sequential Compression Sleeve	39	47	31
Electrophysiology Catheters	15	29	24
Steerable Electrophysiology Catheter	13	17	18
Balloon Inflation Device	4	7	7
Inflation Device	2	4	4
Cardiac Stabilizers & Positioners	5	5	5
Electrophysiology Catheters	13	31	25
Diagnostic Electrophysiology Catheter	17	22	21
Imaging Catheter	6	11	9
Pulse Oxisensor	24	29	28
Femoral Compressor Device	8	8	7
Guidewires	4	6	5
DENTAL			
Diamond Dental Instrument	6	3	1
Dental Burs And Blades	12	7	3
EAR NOSE & THROAT			
ENT Bur	13	15	12
GASTROENTEROLOGY			
Stone Retrieval Basket	5	6	4
Biopsy Forceps	14	17	8
Trocar	27	37	21
Biopsy Forceps, Hot	10	13	5
Endoscopic Electrodes	12	9	7

Device	% of 2010 PFC winners reprocess these items	% of 2011 PFC winners reprocess these items	% of 2011 PFC winners purchase these reprocessed items
GASTROENTEROLOGY (continued)			1
Hospital Bed Patient Monitoring Alarm	7	13	10
Pressure Bag	4	3	3
GENERAL	1		I
Cardiovascular Surgical Saw Blade	13	14	10
Electrosurgical Electrode	11	8	7
Pneumatic Tourniquet Cuff	31	38	30
Disposable Surgical Instruments	20	25	18
Chisel	6	7	3
Curette	8	7	3
Rasp	11	8	4
Hook	8	8	4
Gouge	8	6	3
Laparoscopic Instruments	30	42	28
Laser Probe	9	5	3
Saw Blade	26	30	20
Bur	27	32	23
Scissor Tips	14	21	12
Reloadable Cutters & Appliers	20	25	16
Vessel Sealer/Divider	9	10	7
Suture Passer	11	19	13
Ultrasonic Scalpel	32	42	32
OBSTETRICS & GYNECOLOGY			
Laparoscopic Instruments	23	40	27
OPHTHALMIC			
Phacoemulsification Tip Needle	4	7	3
Laser Probe	6	3	2
ORTHOPEDIC			<u> </u>
Arthroscopy Instruments	29	29	23
Reamer	11	8	3
Cartilage Knife	5	2	2
Burr	30	35	24

Device	% of 2010 PFC winners reprocess these items	% of 2011 PFC winners reprocess these items	% of 2011 PFC winners purchase these reprocessed items
ORTHOPEDIC (continued)			
Drill Bit	30	31	22
Rongeur	7	5	1
Trephine	4	3	1
Countersink	5	5	3
Тар	10	8	3
External Fixation Device	14	19	13
Carpal Tunnel Blade	8	6	4
Orthopedic Cannulas And Trocars	32	20	11
NEUROLOGY	·	·	
Drills, Burrs, Trephines & Accessories	16	13	9

Table 18b: SUD Reprocessing – ELCs

Device	% of 2010 ELC winners reprocess these items	% of 2011 ELC winners reprocess these items	% of 2011 ELC winners purchase these reprocessed items
ANESTHESIOLOGY			
Anesthesia Masks	8	9	4
Laryngeal Airway	25	13	4
Pulse Oximeter Sensor	46	57	39
CARDIOVASCULAR			
Pericardiocentesis Tray	0	4	4
Tissue Stabilizer	8	4	4
Blood-Pressure Cuff	17	26	9
Sequential Compression Sleeve	54	57	35
Electrophysiology Catheters	50	52	39
Steerable Electrophysiology Catheter	38	39	35
Balloon Inflation Device	17	13	9
Inflation Device	0	4	4
Cardiac Stabilizers & Positioners	38	30	26
Electrophysiology Catheters	46	39	30
Diagnostic Electrophysiology Catheter	42	48	35

Device	% of 2010 ELC winners reprocess these items	% of 2011 ELC winners reprocess these items	% of 2011 ELC winners purchase these reprocessed items
CARDIOVASCULAR (continued)			1
Imaging Catheter	25	30	26
Pulse Oxisensor	42	30	22
Femoral Compressor Device	29	13	9
Guidewires	8	4	4
DENTAL	1		
Diamond Dental Instrument	8	4	4
Dental Burs And Blades	8	9	9
EAR NOSE & THROAT			1
ENT Bur	17	17	17
GASTROENTEROLOGY			I
Stone Retrieval Basket	8	17	13
Biopsy Forceps	17	26	17
Trocar	38	35	35
Biopsy Forceps, Hot	8	17	13
Endoscopic Electrodes	8	9	9
Hospital Bed Patient Monitoring Alarm	13	9	4
Pressure Bag	4	0	0
GENERAL	1		1
Cardiovascular Surgical Saw Blade	17	22	26
Electrosurgical Electrode	25	13	4
Pneumatic Tourniquet Cuff	58	43	35
Disposable Surgical Instruments	17	13	9
Chisel	17	9	9
Curette	21	9	4
Rasp	25	0	4
Hook	21	4	4
Gouge	13	4	4
Laparoscopic Instruments	54	39	39
Laser Probe	21	9	9
Saw Blade	42	39	39
Bur	46	43	48

Device	% of 2010 ELC winners reprocess these items	% of 2011 ELC winners reprocess these items	% of 2011 ELC winners purchase these reprocessed items
GENERAL (continued)			
Scissor Tips	21	26	26
Reloadable Cutters & Appliers	25	17	17
Vessel Sealer/Divider	25	9	13
Suture Passer	33	22	22
Ultrasonic Scalpel	58	35	35
OBSTETRICS & GYNECOLOGY			
Laparoscopic Instruments	21	30	22
OPHTHALMIC		1	
Phacoemulsification Tip Needle	4	0	0
Laser Probe	8	13	9
ORTHOPEDIC		1	I
Arthroscopy Instruments	46	30	26
Reamer	25	9	0
Cartilage Knife	21	9	4
Burr	67	52	48
Drill Bit	67	43	35
Rongeur	17	4	0
Trephine	17	4	0
Countersink	25	9	0
Тар	29	9	0
External Fixation Device	33	30	26
Carpal Tunnel Blade	21	13	9
Orthopedic Cannulas And Trocars	46	35	30
NEUROLOGY			1
Drills, Burrs, Trephines & Accessories	21	17	9

VIII. CHEMICAL USE AND WASTE MANAGEMENT PROGRAMS

TOXINS

Mercury

While 53% of PFC winners have already won the MMMF Award (with an additional 11% applying for MMMF in 2011) fully 97% reported eliminating mercury-containing thermometers. In addition, 83% of PFCs had implemented a mercury- free purchasing policy, the cornerstone of a sound mercury-free program, and had performed a facility-wide inventory. More details are presented in **Table 19** below. Please note that all ELC winners have already won MMMF, as it is one of the minimum requirements of being inducted into the Leadership Circle.

TREND: Practice Greenhealth winners are well on their way to becoming mercury- free and have implemented many of the most important elements of the Making Medicine Mercury Free program.

Mercury Free Program Elements	2011 PFC Winners
Established and implemented a Mercury-free Purchasing policy?	83%
Performed a facility-wide inventory for mercury containing items?	83%
Labeled all remaining mercury-containing items?	68%
Inventoried all mercury-containing chemicals in the laboratory	82%
Eliminated or reduced mercury-containing thermometers	97%
Eliminated or reduced mercury-containing sphygmomanometers	96%
Eliminated or reduced mercury-containing Lab thermometers (5 grams mercury)	92%
Eliminated or reduced B5 and Zenker stains	92%
Use low mercury (green tip) lamps	88%
Switched to digital X-Ray	95%
Require proper mercury disposal in construction and renovation projects?	91%
Include mercury-free requirements in contract language	64%
Held a thermometer swap for employees	19%
Held a thermometer swap for the community?	11%

Table 19: Making Medicine Mercury Free

DEHP & PVC

Table 20 illustrates the progress that Award winners are making towards reducing Di(2-Ethylhexyl)Phthalate (DEHP) and Polyvinyl Chloride (PVC) in their facilities; all of the percentages increased from 2010 to 2011 for PFC winners and some increased for ELC winners.

TREND: DEHP and PFC- reduction programs are becoming more standard at health care facilities. The biggest increase was seen in DEHP-free product in the NICU.

DEHP & PVC Reduction	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Have a general DEHP reduction program	45%	55%	54%	52%
Has a program to reduce DEHP- containing products in the NICU	50%	59%	58%	70%
Has a PVC reduction program	46%	49 %	75%	61%
PVC program includes products and supplies	43%	49 %	71%	57%
PVC program includes construction and renovation materials	36%	49%	54%	61%

Table 20: DEHP & PVC Reduction

Nicotine

Practice Greenhealth is pleased to report that 93% of PFC and 100% of ELC winners have entirely smoke free facilities.

Table 21: Nicotine

Nicotine	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners		
Is your entire facility smoke free?	89%	93%	100%	100%		
If more than one main building, is your entire campus smoke free?	76%	89 %	92%	100%		
We allow smoking in the following areas:						
Smoking Lounge	6%	0%	4%	0%		
Chemical Dependency Unit	2%	3%	4%	4%		
Psychiatric Unit	2%	3%	4%	4%		
Outdoors or off property	48%	46%	25%	39%		

Pharmaceutical Waste Management

Recently, hospitals have intensified their efforts towards understanding and properly disposing of waste pharmaceuticals, both hazardous pharmaceutical waste and non-hazardous pharmaceutical waste. The issue is extremely complex, and often hospitals will hire an outside vendor to assist with proper identification of what goes where. While most hospitals are ensuring that they are following the law, some hospitals recognize that not all pharmaceutical waste that is dangerous to the environment or human health is classified as RCRA-regulated hazardous waste. Some facilities are choosing to handle all of their waste as hazardous, which simplifies their program, but is costly. Others use in-house expertise (pharmacists, doctors, nurses and epidemiologists) or hire outside vendors to help identify what they consider "hazardous to human health and the environment" and characterize their waste pharmaceuticals one-by-one, then develop a program to segregate all of those pharmaceuticals as hazardous waste. Pharmaceutical findings are presented in **Table 22**.

TREND: In 2009, only 65% of our PFC winners had implemented pharmaceutical waste management programs, and in only 2 years, that number has grown to 91%; a remarkable increase illustrating a huge growth in awareness of this issue. Significant increases were also noted in separating pharmaceutical waste at the point of clinical generation, (increasing from 66% to 84% in PFCs and 67% to 83% in ELCs) and an increase in pharmaceutical waste segregation by the pharmacy at PFC hospitals (29% to 36% in just one year).

Process	2009 PFC Winners	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Have implemented a pharmaceutical waste management program	65%	79%	91%	96%	91%
of these, hired an outside vendor to help set up your program	77%	67%	58 % internal <u>analysis</u> 58% <u>waste vendor</u> 31% other outside vendor	65%	65% internal <u>analysis</u> 61% <u>waste vendor</u> 39% other outside vendor
separate pharmaceutical waste at the point of generation		66%	84%	67%	83%
send pharmaceutical waste back to pharmacy for proper segregation		29%	36%	42%	45%
collect all pharmaceutical waste at the waste collection point and sort in a satellite accumulation area		29%	29%	21%	26%
treat all pharmaceuticals as hazardous waste		30%	29%	38%	30%
Other		23%	15%	25%	48%

Table 22: Pharmaceutical Waste Management Program

Ethylene Oxide (EtO) and Glutaraldehyde Reduction and Elimination

Tables 23 and 24 show how much progress Award winning hospitals have made towards eliminating EtO and Glutaraldehyde. Please note that the totals for the list of alternatives in these two tables may be more than 100% because hospitals often use more than one type of sterilization or high level disinfection technique.

TREND: More hospitals every year are moving away from Ethylene Oxide where possible and seeking alternative methods for sterilization and high level disinfection of instruments. In 2011, EtO and glutaraldehyde reduction both increased to 88% in our PFC group and increased to 96% in our ELC group. Total elimination of EtO also rose significantly in both categories.

% 2009 PFC % 2010 PFC % 2011 PFC % 2010 ELC % 2011 ELC Et0 Winners Winners Winners Winners Winners Reduced the use of EtO 72¹ 74% 88% 88% 96% Completely eliminated EtO 47% **59%** 54% 74% Alternative % using % using Steam sterilization 63% 86% 79% 96% Low temperature hydrogen peroxide gas 49% 87% 72% 71% plasma (Sterrad) Ozone Plasma 11% 22% ____ Peracetic Acid 48% 57% ____ ____ Other 13% 8% 22% 11% 1) In 2009 the question combined reduction or elimination EtO, so this number is artificially high.

Table23: EtO Elimination and Alternatives

Table 24: Glutaraldehyde Elimination and Alternatives

Glutaraldehyde	% 2009 PFC Winners	% 2010 PFC Winners	% 2011 PFC Winners	% 2010 ELC Winners	% 2011 ELC Winners		
Reduced Glutaraldehyde	68 ¹	80%	88%	79%	96 %		
Completely eliminated Glut	_	35%	39%	63%	61%		
Alternative		% using	% using	% using	% using		
OPA (ASP Cidex OPA, Metrex Metricide OPA)	_		81%	_	91%		
Hydrogen peroxide	_	38%	51%	38%	61%		
Other	_	11%	25%	17%	17%		
1) in 2009 the question combined reduction or elimination EtO, so this number is artificially high.							

Green Cleaning

Green cleaning is big business in health care. Large amounts of time and money are spent in this arena every single day in hospitals all across America. Hospitals have to worry about cleaning, disinfection, and "how clean is clean;" to over-clean wastes time, money and chemicals, and to under-clean is simply dangerous. Encouragingly, Practice Greenhealth Award winning hospitals are not only increasing use of green cleaners, environmentally preferred disposable products, powered cleaning equipment and low-clean flooring, but importantly, are *formalizing* their cleaning programs. In 2010, only half (54%) of PFC and 67% of ELC winners reported having a building specific Green Cleaning Plan for their facility, but by 2011, 68% of PFC and 83% of ELC winners reported having green cleaning plans for their hospitals (See **Table 25**). Similarly, only slightly over half of PFCs and ELCs (54%) used or specified powered cleaning equipment that is Green Seal certified in 2010, but by 2011, 75% of PFCs and 83% of ELCs were using and/or specifying Green Seal equipment. That is an increase of about a quarter for PFCs and ELCs in only one year.

TREND: More hospitals are increasing their use of green cleaning products, equipment, and techniques, and are formalizing their cleaning procedures and contracts. This not only benefits patients and staff, but drives the market toward greener cleaners and equipment (see more information on the Greening the Supply Chain[™] Initiative at www.practicegreenhealth.org/gsc.)

Hospitals continue to recognize the value of reducing toxicity in the cleaning process as evidenced by a rise in almost every area in the lengthy table below. There was also an increase in outsourcing some or all of their cleaning needs by ELC winners.

Green Cleaning	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Have a building specific Green Cleaning Plan for their facility, such as the one outlined in the Green Seal Certification Checklist, standard GS-42	54%	68%	67%	83%
Environmental Services performs their cleaning	84%1	88%	96%²	83%
Outsource (some or all of) their cleaning services	13% ¹	12%	8%²	17%
Use some green cleaning chemicals or products at their facility	90%	96 %	92%	96 %
Use some techniques for minimal chemical use	71%	95%	92%	100%
Cleaners				
General purpose (hard surface) cleaners	75%	79 %	83%	83%
Glass Cleaners	77%	83%	75%	87%
Carpet and Upholstery Cleaners	46%	51%	54%	43%
Cleaning and Degreasing Compounds	39%	46%	54%	61%
Floor cleaners, strippers, waxes	56%	55%	71%	78%
Metal Polish	19%	21%	29%	30%
Drain/Grease trap additives	15%	22%	25%	48%
Fragrances/Odor control additives	21%	35%	25%	48%

Table 25: Green Cleaning

Green Cleaning	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Laundry Soaps/Cleaners	18%	32%	29%	35%
Liquid or foam hand soap		35%		26%
Other	13%	12%	33%	35%
List Certification other than Green Seal as necessary	8%	14%	4%	35%
Cleaners – Have you:				
Collaborated with the Infection Control Committee to identify areas where use of disinfectants can be minimized or eliminated	83%	86%	96%	96%
Used a dilution control system for chemicals?	89%	94%	92%	100%
Disposable Products- Do you:				
Select bathroom paper products with a preference for recycled content ?	82%	82%	92%	91%
Select bathroom paper products with a preference for chlorine free products ?	60%	56%	83%	78%
Use fragrance free products?	70%	78%	83%	91%
Avoid aerosolized cleaning products?	86%	90 %	100%	91%
Avoid fragrance emitting devices, e.g. air fresheners, fragrance or deodorizer sprays and urinal blocks?	44%	61%	54%	78%
Have you evaluated paper dispensing systems to ensure optimal product efficacy?	80%	92%	79%	96%
Other	7%	8%	13%	39%
Powered Cleaning Equipment ³				
Do you use, or specify, powered cleaning equipment (scrubbers, burnishers, extractors, vacuums, or power washers) that is Green Seal or other certified?	54%	75%	54%	83%
Is this equipment designed to minimize vibration, noise, and user fatigue?	75%	79%	92%	96%
Is this equipment operated with a sound level of less than 70 db ?	66%	68%	75%	91%
Does this equipment capture fine particulate matter?	65%	80%	71%	83%
Flooring				
Do you use micro fiber mops ?	84%	90%	96%	96%
Has your facility installed flooring that does not require regular striping and/or polishing ?	64%	69%	96%	100%
Have you purchased carpet certified to ANSI/NSF 140-2007e at the platinum level?		26%		17%
Other (or comments)	16%	14%	25%	30%

2) Please note that these numbers do not add up to 100 because they are not mutually exclusive, a few facilities reported outsourcing some of their cleaning.

3) Green Seal does not actually 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)

Award winning hospitals use a wide variety of techniques to reduce pest problems and reduce the pests' habitats in and near the hospitals. Bugs and pests are a constant battle at hospitals; you simply cannot have them in this environment, yet they are constantly trying to get in. Encouragingly, our Award winning facilities are not resorting to chemical pesticides to win this war (tempting though it may be). They are winning the war by employing or increasing every technique in the IPM arsenal measured in **Table 26**.

Other techniques included everything from using essential oils to discourage lady bugs at a hospital that is located right in their migration path, to non-pesticide heat treatment to deal with bed bugs (a dreaded pest at every hospital), and even purchasing a new dishwasher to eliminate a warm wet environment in a kitchen that was attracting roaches. Hospitals are using Vector Units (electronic fly paper) to control cluster flies, and "Cluster Busters" consisting of crushed egg shells to attract and trap these flies in patient rooms and other sensitive areas. One facility went to the trouble of installing a peregrine falcon nest box on the roof of their hospital to attract falcons to eat their pigeons- another sound chemical-free solution.

TREND: More facilities are formalizing their IPM programs. Practice Greenhealth noted an increase in facilities that reported reducing the use of chemical pesticides through the implementation of an IPM Program (ELC winners increased from 79% to 91%) and through the development of an IPM Plan for their facility (ELCs rose from 71 to 87%). Most striking, in 2010, only 29% of ELCs reported developing a plan for training hospital staff on pests, pesticides, and their role in the IPM process, but by 2011, 61% reported having a Plan in place- that is a 100% increase in only one year.

Table 26: Integrated Pest Management

Integrated Pest Management	% of 2010 PFC Winners	% of 2011 PFC Winners	% of 2010 ELC Winners	% of 2011 ELC Winners
Has reduced the use of chemical pesticides through the implementation of an integrated pest management (IPM) program	82%	84%	79%	91%
Developed an IPM Plan for this facility	77%	77%	71%	87%
Designated an IPM coordinator to supervise all pest elimination activity	75%	74%	67%	87%
Developed a plan for training of all hospital staff on pests, pesticides, and their role in the facility IPM program	33%	36%	29%	61%
Inspected facility for signs of pest activity and conditions that may lead to pest infestation	86%	88%	88%	87%
Facilitated removal of food waste consistent with IPM	77%	81%	79%	83%
Inspected building roofs, checked bird netting, sealed roof parapets and caps	89%	89 %	75%	83%
Use and regularly check bait stations (as a last resort) instead of sprays	89%	92%	79%	83%
Ensured that devices such as <u>bait stations</u> placed in outside areas are locked, secured, clean and in good working order.	88%	90%	71%	78%
Eliminated cracks and holes to keep pests out	88%	94%	83%	78%
Installed door sweeps to keep pests out	83%	94%	79%	70%
Implemented and enforce sanitation procedures to limit pests' access to food and drink. (Address leaky faucets, condensation on pipes, and all edibles.)	89%	93%	79%	87%
Fixed moisture problems (leaks and condensation on pipes)	84%	92%	88%	83%
Used physical barriers to block pest entry and movement (such as door sweeps, screens at chimneys and air intakes, window screens).	80%	92%	79%	78%
Minimized the entry of contaminants into the building from pesticides	77%	87%	63%	74%
Ensured mulch is not used immediately next to building façade	50%	66%	63%	70%
IPM Policy				
Ensured IPM policy is included in all pest control bid specifications when outsourcing pest elimination contracts?	61%	65%	50%	83%
Contracted with pest control companies that meet 100% of the requirements for IPM certification.	64%	76%	54%	78%

Solvent Distillation

Tables 27 and 28 illustrate the percentages of Award winners that are distilling solvents, alcohol, or other chemicals and reaping the financial benefits. Typically, payback periods are very short for these types of projects because a facility saves both the cost of the virgin solvent *and* the cost of disposing the spent solvent as hazardous waste. Payback periods as short as 6 months have been reported.

TREND: Interestingly, solvent distillation percentages went up for all 2011 PFC winners, but went down slightly for ELC winners. Because the sample size for the ELCs is relatively small, these decreases are observed if one or two ELCs stop recycling their solvents. In spite of the small decrease, winners saved over \$850,000 from solvent distillation! The majority of the savings came from reduced solvent purchases, which averaged around \$80-\$90 per staffed bed.

OPPORTUNITY: It appears that more PFC and ELC winners could save money and reduce waste if they would take advantage of solvent distillation.

Table 27: Solvent Distillation

Solvent Distillation	2009 PFC Winners	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Has a program to recycle or distill solvents, alcohols or other chemicals from the lab	52%	46%	51%	71%	61%
Distill Xylene	_	32%	37%	63%	61%
Distill Alcohol	—	29%	34%	58%	43%
Distill Formalin		22%	24%	29%	22%

Table 28: Savings from Recycling Solvents

Solvent Distillation	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Annual savings from reduced purchase costs		\$556,465	_	\$142,015
Annual savings from reduced disposal costs		\$96,980	_	\$63,510
Combined annual savings for all facilities	\$290,000	\$653,444	\$120,000	\$205,530
Average Savings per facility	\$12,660	\$5,540	\$12,000	\$8,805
Average Savings per staffed bed	\$44.50	\$82	\$38.50	\$91
Average Savings per APD	\$0.08	\$0.17	\$0.28	\$0.34
Gallons distilled		25,290		26,520
Gallons reused		18,730		19,490

IX. ENVIRONMENTALLY PREFERABLE PURCHASING (EPP) PRODUCTS AND PRACTICES

In August, Practice Greenhealth launched its **Greening the Supply Chain™ Initiative.** The Initiative is designed to engage businesses to meet the growing demand for more environmentally preferable products within health care facilities, GPOs and in the business marketplace. These businesses are coming together with the health care sector to address the essential elements to producing environmentally preferable products and processes.

EPP Purchasing Practices

TREND: Table 29 illustrates EPP practices at our Award winning facilities; almost all the PFC and ELC winners are working with their GPOs to procure greener products. A number of ELC facilities developed an EPP policy this year, and an increase was also seen in PFC winners using their product evaluation committee to select green products.

OPPORTUNITY: More hospitals could ask suppliers to track EPP purchases for them, or develop other tracking techniques.

Table 29: EPP Purchasing Practices

EPP Practices	% of 2009 PFC Winners	% of 2010 PFC Winners	% of 2011 PFC Winners	% of 2010 ELC Winners	% of 2011 ELC Winners
Have communicated a desire for environmentally preferable products with their GPO		89%	92%	92%	91%
Has an Environmentally Preferable Purchasing (EPP) policy	68%	70%	68%	71%	87%
Product evaluation committee considers environmental impacts in its selection process	77%	82%	87%	92%	96 %
Do you ask suppliers to track and provide EPP purchasing reports in your purchasing contracts?			36%		52%

Table 30a and 30b compare the purchasing practices and policies of PFC and ELC Award winners, respectively. The first row in Table 30a can be read as: "89% of PFC Award winners evaluated mercury in their purchasing decisions in 2010 and 2011; while 50% had mercury specifically mentioned in their *purchasing policies* in 2010, and 74% mentioned mercury-free purchasing in their purchasing policies in 2011 (a fantastic increase in one year).

TREND: Practice Greenhealth proudly recognizes an increase by PFC and ELC winners, in evaluation and formal elimination (through policy) of each of the chemicals listed in the table below. An increase was seen in both evaluation and formal language for every chemical listed for PFC winners and almost every chemical listed for ELC winners. This is quite an accomplishment in one year.

OPPORTUNITY: There is still room for formalizing many of these constituents in official purchasing policy language.

Table 30a: EPP Purchasing Practices and Policies – PFC winners

Material/Chemical	Evaluated in purchasing – % of 2010 PFC Winners	Evaluated/ Avoided in purchasing — % of 2011 PFC winners	Had Language in Policy – % of 2010 PFC Winners	Had Language in Policy – % of 2011 PFC Winners
Mercury	89%	89%	50%	74%
Lead	54%	59%	16%	32%
PBTs (persistent bioaccumulative toxics)	29%	42%	28%	36%
DEHP (di-2-ethylhexylphthalate)	61%	69%	25%	42%
PVC (vinyl, polyvinyl chloride plastics)	56%	65%	26%	42%
Halogenated, chlorinated or bromated flame retardants	43%	46%	18%	34%
Phthalates	27%	45%	18%	32%
Carcinogens, mutagens, reproductive toxics	48%	54%	20%	40%
Bisphenol-A	37%	52%	19%	33%
VOCs (volatile organic compounds)	58%	65%	16%	36%
Latex	76%	75%	22%	63%
Halogenated plastics	19%	33%	4%	22%
Perfluorinated compounds	11%	32%	2%	19%
Benzidine dyes and pigments	18%	31%	2%	15%
Lubricant parafins	11%	27%	2%	14%
Other:	6%	0.1%	4%	59%

Table 30b: EPP Purchasing Practices and Policies – ELC winners

Material/Chemical	Evaluated in purchasing – % of 2010 ELC Winners	Evaluated/ Avoided in purchasing – % of 2011 ELC Winners	Had Language in policy – % of 2010 ELC Winners	Had Language in policy – % of 2011 ELC Winners
Mercury	71%	100%	58%	78%
Lead	50%	74%	25%	35%
PBTs (persistent bioaccumulative toxics)	29%	43%	25%	48%
DEHP (di-2-ethylhexylphthalate)	58%	74%	21%	52%
PVC (vinyl, polyvinyl chloride plastics)	58%	87%	38%	57%
Halogenated, chlorinated or bromated flame retardants	38%	57%	33%	35%
Phthalates	25%	48%	25%	30%
Carcinogens, mutagens, reproductive toxics	50%	65%	25%	52%
Bisphenol-A	33%	57%	8%	26%

Material/Chemical	Evaluated in purchasing – % of 2010 ELC Winners	Evaluated/ Avoided in purchasing – % of 2011 ELC Winners	Had Language in policy – % of 2010 ELC Winners	Had Language in policy – % of 2011 ELC Winners
VOCs (volatile organic compounds)	67%	74%	17%	39%
Latex	83%	83%	25%	61%
Halogenated plastics	29%	22%	8%	13%
Perfluorinated compounds	29%	26%	8%	13%
Benzidine dyes and pigments	33%	22%	8%	9%
Lubricant parafins	25%	17%	13%	13%
Other:	4%	9%	4%	13%

EPP Purchasing Practices and Policies Expanded

TREND: An increase was seen in evaluating the attributes listed in **Table 30a(exp) and 30b(exp)**, some of which are a little harder to measure and evaluate than the chemical constituents mentioned above, such as life cycle analysis. However, not only are hospitals looking at water and energy efficiency, but over half of all winners are considering life cycle analysis for at least some of their purchases!

OPPORTUNITY: There is still room for formalizing many of these constituents in official purchasing policy language.

Table 30a(exp): EPP Purchasing Practices and Policies Expanded – PFC winners

Attribute	Evaluated in purchasing % of 2010 PFC Winners	Evaluated/ Avoided in purchasing % of 2011 PFC Winners	Included in policy % of 2010 PFC Winners	Included in policy % of 2011 PFC Winners
Energy Efficiency	76%	79	35%	54
Water Efficiency	65%	72	32%	43
Excessive packaging	52%	66	31%	41
Reducing plastics that are not as easy to recycle as #1 and #2?	34%	35	8%	19
Durability/expected length of service	61%	73	10%	35
Life Cycle Analysis	44%	51	10%	18
Whether the product becomes or generates hazardous waste	61%	72	18%	44
Other Criteria	12%	_	7%	—

Table 30b(exp): EPP Purchasing Practices and Policies Expanded – ELC winners

Attribute	Evaluated in purchasing % of 2010 ELC Winners	Evaluated/ Avoided in purchasing % of 2011 ELC Winners	Included in policy % of 2010 ELC Winners	Included in policy % of 2011 ELC Winners
Energy Efficiency	83%	87%	33%	57%
Water Efficiency	79%	87%	25%	48%
Excessive packaging	54%	78%	25%	43%
Reducing plastics that are not as easy to recycle as #1 and #2?	50%	43%	13%	17%
Durability/expected length of service	75%	83%	25%	48%
Life Cycle Analysis	38%	57%	25%	26%
Whether the product becomes or generates hazardous waste	58%	83%	33%	48%

Electronics

In the U.S., reportedly less than 15% of our electronic waste is sent to recyclers; the rest is dumped or burned. Even electronic waste (such as computers, monitors and medical devices) that is sent to recycling services may not be properly handled. According to e-Stewards, recyclers send an estimated 70-80% of their electronic waste to less developed countries where they are burned for metals, exposing people and the environment to a host of toxins. To avoid this, ask for e-waste recyclers (or ask your GPO for e-waste recyclers) who have taken additional steps to be environmentally responsible. Practice Greenhealth suggest asking for recyclers who are involved in the e-Stewards[®] program (http://e-stewards.org/find-a-recycler/).

Table 31 reports how many facilities are involved with EPEAT[®] (the global registry for greener electronics) to purchase greener and recycle used electronic equipment. This is a pressing issue for many health care facilities, as 70% of PFC and 83% of ELC facilities performed IT energy efficiency upgrades.

TREND: PFC and ELC winners are striving to do the right thing with electronic wastes. There was an increase in the use of EPEAT standards for purchasing electronic equipment in most areas in Table 31.

OPPORTUNITY: More health care facilities could formalize their policies to require or prefer the purchase of EPEAT registered products and use certified recyclers for electronic waste; information can be found at http://e-stewards.org/about and http://www.epeat.net.

Table 31: EPEAT and Waste Electronics

Activity	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Do you use EPEAT standards for purchasing electronic equipment?	41%	48%	63%	70%
Do you use E-Steward certified recyclers for your electronic waste? See http://e-stewards.org/find-a-recycler/	_	47%	_	65%
ls your organization an EPEAT Partner? (see http://www.epeat.net/Partners/Purchasing/)	24%	18%	17%	17%
Does your organization have a policy requiring or preferring the purchase of EPEAT-registered products?	28%	27%	54%	52%
Do you manage your old computers and E-Wastes as Universal waste?	61%	65%	79%	91%
Have you done any Information Technology (IT) energy efficiency upgrades?	_	70%		83%

Table 32 presents data requested in the 2011 Award applications only, regarding purchasingdecisions involving lighting and other equipment.

TREND: Energy efficiency was reported to be extremely or very important by a sound majority of PFC and ELC winners when purchasing lighting or building systems equipment. Energy efficiency was a bit less important when purchasing clinical equipment. The table can be read as "86% of PFCs stated energy efficiency was very or extremely important and 58% paid more for this item."

Table 32: Energy Efficiency Rankings

How important is energy efficiency in the purchase of this item?	% 2011 PFC Winners very or extremely important/ paid more for this item	% 2011 ELC Winners very or extremely important/paid more for this item
Lighting (electronic ballast)	86 / 58	96 / 57
Lighting (energy efficient lamps)	86 / 59	96 / 70
Lighting (LED exit signs)	79 / 52	83 / 65
Lighting (other)	73 / 42	65 / 52
Diagnostic Imaging Equipment	30 / 19	48 / 26
Anesthesia/Monitoring Equipment	29/12	26/17
Building Systems Equipment	75 / 53	74 / 35
Laboratory Equipment	31 / 148	43 / 30

Reusable Linens

Tables 33a and 33b summarize data reported on reusable linens. The table can be read as follows: Twelve percent (12%) of 2010 PFC winners and 25% of 2011 PFC winners are using reusable drapes *less* than half of the time. Twenty-one percent (21%) of 2010 PFC winners and 19% of 2011 PFC winners are using reusable drapes *more* than half of the time.

TREND: There is a steady increase in reusable linen use and reusable scrubs remain by far the most popular reusable linen.

OPPORTUNITY: There is still room for growth in the reusable linen arena.

Table 33a: Reusable Linens – PFC winners

Are you using these reusable items at your facility?	Less than 50% 2010 PFC Winners	Less than 50% 2011 PFC Winners	More than 50% 2010 PFC Winners	More than 50% 2011 PFC Winners
Surgical Drapes	12%	25%	21%	19%
Surgical Gowns	19%	29%	28%	35%
Incontinent Products (Underpads & Briefs)	19%	21%	38%	33%
Isolations Gowns	12%	19%	32%	32%
Scrubs	2%	0%	85%	91%
Surgical Packs (sterile and nonsterile)	19%	33%	22%	24%

Table 33b: Reusable Linens – ELC winners

Are you using these reusable items at your facility?	Less than 50% 2010 ELC Winners	Less than 50% 2011 ELC Winners	More than 50% 2010 ELC Winners	More than 50% 2011 ELC Winners
Surgical Drapes	29%	35%	13%	35%
Surgical Gowns	33%	22%	54%	65%
Incontinent Products (Underpads & Briefs)	13%	30%	50%	52%
Isolations Gowns	25%	26%	38%	43%
Scrubs	0%	0%	100%	100%
Surgical Packs (sterile and nonsterile)	33%	35%	46%	35%

Other Reusable Products

One key to reducing solid waste is to purchase more reusable products. **Table 34** presents data on percent of facilities that have switched to specific reusable products.

TREND: All reusable items increased or held steady between 2010 and 2011 for both PFC and ELC winners, with the exception of surgical basins. There was more of a discrepancy between PFC and ELC reusables in 2010, but this year PFC winners are closing the gap. Significant increases were reported by the PFC winners in many categories, including totes, shipping and RMW containers and pharmacy waste bins. Rigid sterile cases rose from 50% to 75% at PFC facilities in one year, greatly reducing blue wrap at those facilities.

Table 34: Reusable Products

Reusable Products	Reuse this item 2010 PFC Winners	Reuse this item 2011 PFC Winners	Reuse this item 2010 ELC Winners	Reuse this item 2011 ELC Winners
Totes for internal deliveries	60%	81%	83%	87%
Shipping containers (totes)	45%	54%	50%	65%
RMW shipping	41%	64%	75%	78%
Rigid sterile cases for surgical items	50%	75%	63%	61%
Pharmacy waste containers	36%	58%	42%	61%
Surgical basins/biowaste tubs	29%	23%	58%	35%
Trocar (tubing)	20%	19%	17%	26%
Other – describe	12%	18%	21%	22%

X. FOOD

Sustainable food projects in health care are blossoming all over the country. Not only are hospitals offering healthier choices in their cafeterias and food services, they are hiring executive chefs, creating co-ops to serve their needs, and really "kicking it up a notch." Hospitals are eating less meat, are recognizing the risk of agricultural antibiotic over-use, and are pledging not to purchase meat raised in this manner.

Table 35 illustrates the impressive growth of PFC and ELC winners who have signedHealth Care without Harm's (HCWH)Healthy Food Pledge and/or have signed onto theirBalanced MenusProgram.

Table 35: HCWH Food Pledges

2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
47%	55%	54%	83%
37%	50%	29%	61%
	Winners 47%	Winners Winners 47% 55%	WinnersWinnersWinners47%55%54%

2) HCWH Balanced Menus Program: (http://72.32.87.20/lib/downloads/food/Balanced_Menus_Challenge.pdf)

Another opportunity for sustainability in the cafeteria and food services operations lies in reducing the tons of solid waste generated therein. A good discussion on **Choosing Environmentally Preferable Food Service Ware** is presented by Health Care Without Harm at: http://www.noharm.org/lib/downloads/food/EPP_Food_Svc_Ware.pdf

Food Service and Cafeteria Items

Reusable and biodegradable food service items

From 2010 to 2011, there was a decrease in disposable food service items in both the cafeteria and patient food services by our Award winners. The data shows an increase in reusable flatware, plates and dishes in the cafeteria and in patient food services for all winners. An increase in paper and compostable/ biodegradable products was also observed for flatware, plates and dishes in both cafeteria and patient food services for both sets of winners.

Flatware, plates, dishes, and cups in the cafeteria and clamshells were regularly composted, particularly by ELCs. Of special note, is that 61% of ELC and 45% of PFC indicated their compostable products are <u>certified compostable</u>. This is exciting news. Paper or biodegradable products are most beneficial when composted rather than disposed in a regular municipal landfill.

Compostable/biodegradable items used were made of: corn, paper fiber, molded fiber, potato, sugarcane, cornstarch, paper-wood-food combination, bagasse, plant fiber, and Ingeo biopolymer, a PLA resin derived entirely from plants (sugarcane and corn).

TREND: ELCs are definitely leading the charge in this area. Highlights include: 85% of ELCs are using some biodegradable plates and dishes in cafeteria; 18% are exclusively using these products. Almost all of the cups in the ELC cafeterias are paper and/or reusable and 95% their plates and dishes in patient food service are reusable.

OPPORTUNITY: PFCs are also making improvements on reducing disposables in the cafeteria and food services, but they can look to the ELCs to really optimize their programs.

Polystyrene (Styrofoam) Elimination

The 2009 Awards Metrics Benchmark Report stated that 60% of PFC winners indicated they had reduced their use of polystyrene products and were using paper or biodegradable products, but only 25% were able to completely eliminate polystyrene.

Encouragingly, in 2011 there was a decrease in the use of polystyrene in both PFC and ELC cafeterias and food services. PFCs have reduced or eliminated polystyrene in their cafeteria (66%), in their patient food services (58%) and their clamshells (50%). ELCs have reduced or eliminated polystyrene in their cafeterias (86%), in their patient food services (61%) and their clamshells (69%). Some facilities are also eliminating polystyrene from their catering.

TREND: Polystyrene is being replaced with more environmentally friendly alternatives in many Award winning facilities, in spite of the fact that this is a tough area to reach an acceptable price point because Styrofoam is so inexpensive.

Local and Organic Food Purchasing

Practice Greenhealth winners continue to lead the industry with innovative ways to get local food into their hospitals. In 2010 one Award winning hospital pledged to spend 10% of their food dollars on local fare and worked to support a small produce and buyers' co-op to overcome obstacles that stood in the way of getting local food into that facility. A coop is often needed because one small farmer can generally not meet a hospital's vast food requirements. This year, another Award winning hospital located in the Midwest has worked to establish a local co-op to help supply their food needs. These actions support the local economy, reduce greenhouse gas emissions (from reduced transportation miles), and improve the health and freshness of cafeteria and patient food services offerings.

Several facilities are tracking their food purchases; one west coast hospital established an elaborate tacking system that indicates how many miles are on each of their local food purchases! This allows them to not only track dollars spent, but allows them to calculate greenhouse gas (GHG) reductions from their program. A number of our Award winners have set goals for percent of food budget purchased locally.

Some hospitals have developed direct relationships with farmers, while others support local farms through their purchasing organizations or vendors (see Table 36 below). Other innovative ideas from 2011 include buying all of what is left over at their farmers markets, or establishing working relationships with local Amish and Hutterite communities. Table 36 illustrates which items are being purchased locally and/or are organic. Hospitals also included the following sustainable food options: cage free eggs, hormone free milk, cheese, butter, ice cream, other dairy organic juice blends, and locally produced soups. Meat and protein purchases included grass fed beef, and local bison, pork and lamb. Also offered were organic yogurts, locally made grocery products include pudding, Asian dumplings and noodles, appetizers, and deli meats. One hospital follows guidelines from the Monterey Bay Aquarium Seafood Watch Recommendations.

TREND: Hospitals continue to build relationships with local farmers and support the local economy. They are offering more local and organic fare each year, and are developing co-ops to meet their needs locally.

Table 36: Local and Organic Food

Local and Organic Food	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Have established relationships with local farmers	64%	71%	88%	91%
Buy local and/or organic:				
Chicken	28%	31%	58%	61%
Eggs	33%	36%	58%	57%
Meats	29%	36%	58%	52%
Milk	52%	63%	75%	61%
Fish	29%	23%	33%	26%
Produce	75%	73%	92%	83%
Baked goods	54%	59%	88%	78%
Other	14%	10%	33%	43%

Table 37, Beverages and Vending, illustrates Award winners' awareness of a number of issues surrounding beverages, from reducing solid waste through reusable coffee mugs and reducing the use of bottled water, to the health issues caused in part by sugar sweetened drinks.

TREND: More PFC and ELC winners have eliminated water bottles in every area they are commonly found. In addition, the majority of PFC and ELC winners are acting to encourage healthier and greener beverage choices.

Beverages and Vending	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Offered employees reusable water bottles, coffee or travel mugs	76%	83%	83%	87%
Offered fewer sugar-sweetened beverages in the cafeteria and food services	_	74%	_	91%
Offered fewer sugar-sweetened beverages in vending machines?	_	63%	_	57%
Provided healthier food in vending machines?	_	81%	_	91%
Provide access to free sources of drinking water ?		99%		100%
Have eliminated bottled water in:	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Cafeteria	6%	12%	17%	26%
Patient services	22%	31%	38%	39%
Meeting rooms	25%	26%	46%	65%
Vending machines	4%	8%	8%	17%
Other	8%	19%	21%	39%

Table 37: Beverages and Vending

Healthier Food Choices

Offering healthier foods in cafeterias and patient food services wasn't on the radar of many hospitals in America until recently. With this in mind, Practice Greenhealth is proud to present the impressive numbers in Table 38 below. On average, our winners are offering healthier food choices in all of the categories listed below. Not only are the patients, guests and staff eating better at the hospital, but they just might take some of these healthier ideas home with them.

Other healthy offerings included: offering gelato instead of ice cream (which is made from milk instead of cream), using 1% or skim milk as the standard offering, and switching from ice cream sundae employee celebrations to healthy menu celebrations. Additional programs included offering processed foods, providing nutritional information to staff and patients, increasing availability of fresh fruit and veggies, and posting the weight watchers point system for their foods.

TREND: Food offered in our Award winning hospitals is getting healthier as evidenced by increases in many of the metrics measured below. Highlights include the impressive achievement of 100% of ELC hospitals and 92% of PFC hospitals having reduced trans fats in their food offerings and 96% of ELC and 89% of PFC winners having reduced total fat.

Table 38: Healthier Food Choices

Healthier Food Choices	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners		
Have reduced use of:						
Fat	82%	89%	88%	96%		
Trans fats	91%	92%	100%	100%		
Salt	75%	86%	71%	87%		
Hydrogenated oils	76%	85%	79%	91%		
High fructose corn syrup	52%	68%	71%	70%		
Portion sizes	60%	75%	58%	87%		
Other included:	13%	19%	21%	39%		
Have increased use of:	·					
Fiber	68%	78%	79%	91%		
Whole grains	82%	89%	88%	96%		
Other	10%	19%	8%	26%		

Table 39 provides indicators that illustrate our hospitals' commitment to providing healthier food and a general awareness of issues surrounding food. Another creative idea included the creation of three organic vegetable and herb gardens.

TREND: Few hospitals host fast food establishments on campus, and many are offering fair trade coffee, hosting farmers markets or offering healthy cooking classes. 81% of PFCs and 91% of ELCs are working with their distributors and vendors to be able to offer healthier and more sustainable foods.

Table 39: Other Food Projects

Other Food Projects	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Have a fast food restaurant on your campus?	6%	11%	17%	9%
Offer Fair Trade Coffee	63%	66%	75%	74%
Host a Farmers Market	46%	51%	38%	43%
Offer an employee CSA (community supported agriculture) program	11%	10%	29%	35%
Grow vegetables onsite for use in the kitchen		8%	_	26%
Grow herbs onsite for use in the kitchen		11%		35%
Offer garden space for community?		5%	_	17%
Educate via healthy cooking classes		73%	_	78%
Reduced deep fat fryers	33%	33%	54%	39%
Eliminated deep fat fryers	12%	11%	25%	22%
Compost food waste onsite	4%	5%	8%	13%
Compost food waste offsite	25%	29%	58%	48%
Working with a GPO on any healthy food initiatives	48%	61%	67%	74%
Communicated with your distributor or vendor about your interest in including more healthy and sustainable foods ?		81%		91%

XI. FACILITIES AND CONSTRUCTION

EBE: Green Building and Sustainable Design

Practice Greenhealth members are increasingly recognizing the need for both green buildings and sustainable operations. Hospitals are starting to create sustainable design standards for new construction and renovations and the number of LEED certified hospitals is on the increase. Evidence based design, LEAN principles, and green building standards are working together to create healing environments. There are varied approaches to green and sustainable building employed by our winners, see **Tables 40 and 41** for details.

Table 40: Green Building

Green Building	% of 2011 PFC Winners	% of 2011 ELC Winners
Facility has been LEED certified	5	13
Currently building or planning any new building projects	44	57
Currently building or planning any new renovation projects	65	83
Involved in a Pebble Project with the Center for Health Designs	1	13
Practice evidence based design	52	70
Have a green or living roof	13	43
Following the green guide for health care		
Renovation	11	30
New Construction	32	35
Following LEED guidelines but do not plan on certification		
Renovation	15	26
New Construction	21	48
Following LEED guidelines and the building will be LEED certified		
Renovation	8	9
New Construction	25	22
New construction is complete and has been LEED certified		
Renovation	0	0
New Construction	14	22
High-efficiency HVAC		
Renovation	10	13
New Construction	14	22
Both	52	61
High-efficiency building controls		
Renovation	11	17
New Construction	14	9
Both	53	70
Low-flow water fixtures		
Renovation	11	13

Green Building	% of 2011 PFC Winners	% of 2011 ELC Winners		
High-efficiency building controls (continued)				
New Construction	8	17		
Both	58	70		
Low-emissivity glass for windows				
Renovation	7	0		
New Construction	18	43		
Both	36	39		
Increased day lighting Type				
Renovation	6	4		
New Construction	24	57		
Both	31	30		

Table 41: Sustainable Design and Construction

Sustainable Design and Construction	% of 2011 PFC Winners	% of 2011 ELC Winners
Use of physical and mechanical design and materials	to improve indoor air quality	
Renovation	10	0
New Construction	8	17
Both	54	78
Optimize layout and orientation of building to optim	ize energy performance	
Renovation	3	0
New Construction	17	48
Both	32	39
Reuse/recycle demolition materials		
Renovation	11	4
New Construction	3	9
Both	54	87
Minimize site development footprint		
Renovation	5	4
New Construction	15	35
Both	29	43
Add language to contract specifications that construc	ctor will follow LEED or GGHC requirements	
Renovation	3	0
New Construction	14	17
Both	24	43
Specify cogeneration, fuel cells, renewable energy sy	rstems and other alternative energy resources as fea	sible
Renovation	3	0
New Construction	8	22
Both	21	30
Other	8	26

Energy

Energy characteristics

Energy, as always, is a hot topic in health care. Reducing energy costs in this economy is a primary concern across all industries and health care is no exception. Reporting on energy use and conservation, however, is extremely complicated. Reviewing and analyzing energy data is quite complex and can give misleading results. In addition, the type of energy used and associated pricing is dependent on the geographic location, and our winners are spread from coast to coast. Nonetheless, Practice Greenhealth began to collect energy data in 2010 and presents results from 2010 and 2011 below.

The 141 Award winners used in this report, consumed **4 billion kilowatt hours of** electricity, 33 million dekatherms of natural gas, and 3.5 million gallons of fuel oil, at a cost of nearly \$460 million. This year conservation projects saved our hospitals \$8.6 million. We all can celebrate these monetary savings, as well as reduced greenhouse gas (GHG) emissions. An executive summary and details of energy use and energy savings are presented in Table 42 immediately below. The 141 Award winners used in this report, consumed 4 billion kilowatt hours of electricity, 33 million dekatherms of natural gas, and 3.5 million gallons of fuel oil, at a cost of nearly \$460 million.

Table 42: Energy Executive Summary

ENERGY	2011 PFC and ELC Winners
Total Energy Costs	\$460 million
Total Energy Savings	\$8.6 million

Table 43 presents some characteristics of our winners' energy programs, such as participation in US EPA's Energy Star program. In 2009, only 38% of PFC winners reported that they were members of US EPA's Energy Star Program, but by 2011, membership has grown to 62% of PFC and 74% of ELC winners. The average Energy Star rating for 2011 PFC and ELC winners was 50, and 52 respectively. Practice Greenhealth would like to see these numbers rise. In response to a new question on the application, 70% of PFCs and 91% of ELCs house their own data centers.

TREND: Many facilities are reaping significant savings through energy and water conservation projects. Use of Energy Star has increased for Practice Greenhealth winners and three out of four top performing facilities are Energy Star Partners.

Table 43: Energy Characteristics

Energy Characteristic	2009 PFC Winners	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Are EnergyStar Partners	38%	57%	62%	75%	74%
Average Energy Star rating for their building	_	58	50	59	52
Completed data collection through Portfolio Manager	_		51	_	43
Range of Energy Star ratings		16 to 95	12-90	27 to 84	23-84
Participate in the E ² C Program (between ASHE and EnergyStar)	8%	19%	14%	21%	30%
On-Site Data Center?	_	_	70%	_	91%

Engaged in energy efficiency projects	97%	82%	71%	88%	91%
Total Cost of Energy per Staffed Bed ¹		\$13,215	\$10,661	\$12,190	\$10,661
Cost of all types of energy per APD ¹	_	\$31	\$27	\$33	\$27
1) The 2011 data is averaged for PFC and ELC combined.					

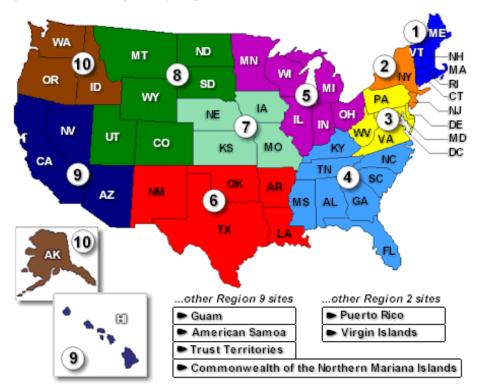
There is a vast amount of energy information to present in this section. This section will begin by looking at energy use and energy costs, then present energy efficiency information.

Energy Use

Energy Use and Cost by Region:

Figure 8 illustrates the US Environmental Protection Agency (EPA) regulators regions. Because energy use and type of fuel is so dependent on geographic location, the energy data will be presented by US EPA regulatory region.

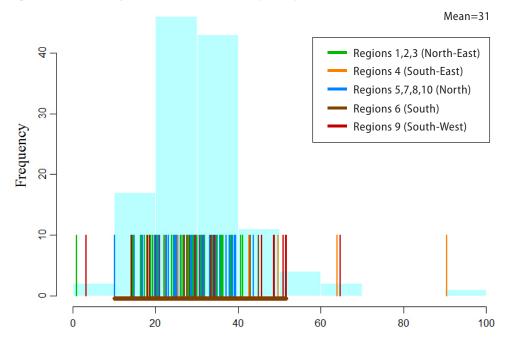
Figure 8: US EPA Regulatory Regions



On the following histogram, **Figure 9**, some of the EPA regions have been combined for simplicity, as follows:

Regions 1, 2 and 3 = Northeast Regions 4 = Southeast Regions 5, 7, 8, and 10 = North Region 6 = South Region 9 = Southwest **Figure 9** represents electricity use in kilowatt hours per square foot (along the x-axis) and is color coded by US EPA region (see key). The average use was 31 kilowatt hours per square foot of facility.

Figure 9: Electricity Use in Kilowatt Hour per Square Foot



As noted above, Award winners used 4 billion kilowatt hours of electricity. **Table 44** presents a breakdown of kilowatt hours used and energy use, by fuel type.

Average Energy Use Data:	2011 Winners All Facilities
Electricity	
Total kilowatt hours used by winners in kWh	4 billion
Energy Use Index for Electricity	108 Kbtu per sq. foot
Kilowatt hours per square foot	31
Kilowatt hours per APD	225
Kilowatt hours per staffed bed per day	246
Kilowatt hours per FTE	11,136
Kilowatt hours per licensed bed/day	219
Natural Gas	
Total dekatherms of natural gas used by winners in dekatherms	33 million
Natural Gas in dekatherms per Sq. foot	0.31
Dekatherms per APD	2.3

Table 44:	Energy	Use	Details
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Average Energy Use Data:	2011 Winners All Facilities
Dekatherms per staffed bed	982
Dekatherms per FTE	118
Dekatherms per licensed bed	811
Energy Use Index for Natural Gas	288 kBtu per sq. foot ¹
Fuel Oil	
Total gallons used by winners ²	3.5 million
Total Energy Use	
Total MMBTUs used by PFC + ELC	46.2 million
MMBTUs / square foot	0.45
MMBTUs / APD	2.27
MMBTUs / staffed bed	1,225
MMBTUs / licensed bed	1,018
	151

Energy Costs

Award winners spent over \$325 million on electricity last year, but what are facilities paying for electricity? **Figure 10** illustrates that the average cost for electricity across the nation is 9 cents per kilowatt hour while **Figure 11** illustrates the average cost per square foot of facility is \$2.78 per square foot, annually.

Figure 10: Cost of Electricity per Kilowatt hour

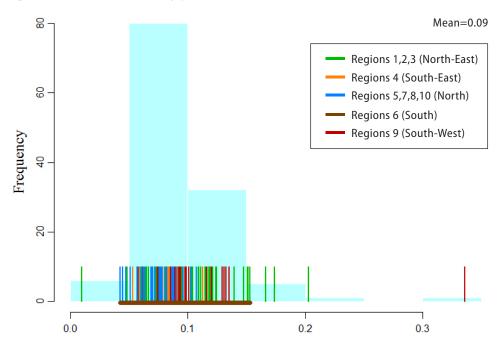
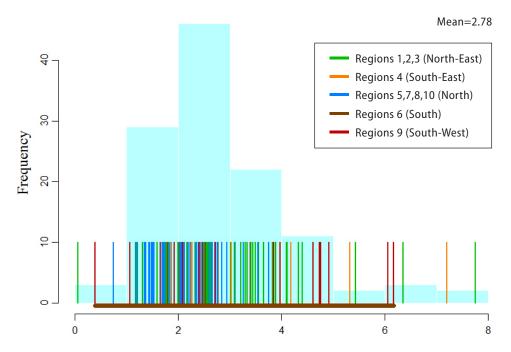


Figure 11: Cost of Electricity per Square Foot



Obviously energy costs will vary by facility size. **Figure 12a and 12b** both graphically represent total energy costs (electricity, natural gas and oil costs) per square foot. The distribution of total cost per square foot for all PFC and ELC winners is represented in **Figure 12a.** When total energy costs versus square foot are plotted in **Figure 12b** below, you see that the energy costs go up linearly, with the larger facilities paying more, as you would expect. The R² value of 0.759 shows a pretty good correlation between size and cost, with some variation with larger facilities (an R2 value of 1.0 shows a perfect correlation).

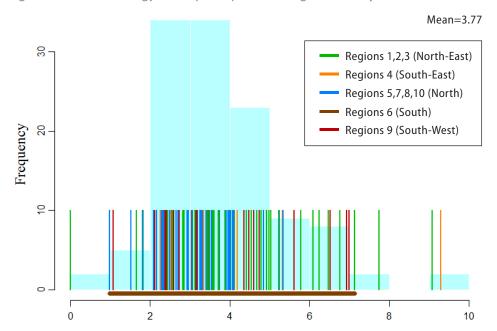
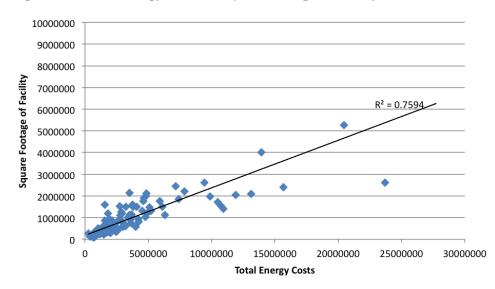


Figure 12a: Total Energy Costs per Square Footage of Facility

Figure 12b: Total Energy Costs vs. Square Footage of Facility



What is more interesting is to analyze total energy costs per staffed bed, see Figure 13 immediately below. This data exhibited an exponential relationship, which suggests that no economy of scale exists. The data suggests that the more beds you have, the more energy you will use, <u>per bed</u>. What this is likely exhibiting, is that a small hospital with one main building only has to heat or air condition that main building, and this main building will have a smaller surface area, which translates into less energy loss. However a much larger facility with many more beds will tend to have a larger campus with more buildings and a number of buildings that do not contain beds. The larger facility will have more heat loss, and additional parking lots. In reality, some of our hospitals operate more like a small city, and even have their own police department. These extra buildings have to be lit and temperature controlled, but do not contain any beds. The data exhibit an R2 of 0.627, so the correlation is not perfect, but the trend of the graph is strongly exponential, not linear.



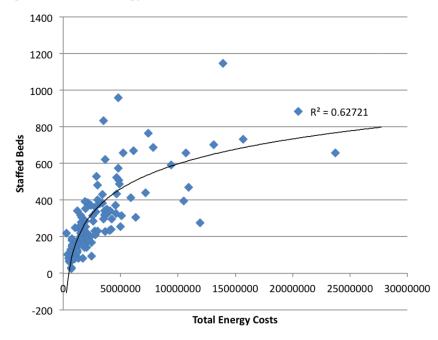


Table 45 presents data on energy costs normalized by a number of different factors. The normalization factor that correlates best to electricity costs was, not surprisingly, square footage.

Different types of energy can be combined or compared by converting all energy to British thermal units, or Btus. The nomenclature for a million Btus is MMBtu. See Appendix 1 for histograms expressing energy analyzed by Btu.

Table 45:	Energy	Cost	Details
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Average Annual Energy costs	2011 Winners All Facilities
Electricity Costs	
Total Cost of Electricity (sum all facilities)	\$325 million
Average Cost per kilowatt hour	0.09
Cost per square foot	2.78
Cost per APD	\$19
Cost per staffed bed	\$7,694
Cost per licensed bed	\$6,520
Cost per FTE	\$972
Natural Gas Costs	·
Total Cost of Natural Gas (sum all facilities)	\$127 million
Average Cost per dekatherm	\$7.19

Average Annual Energy costs	2011 Winners All Facilities
Cost per square foot	\$1.10
Cost per APD	\$8.20
Cost per staffed bed	\$3,114
Cost per licensed bed	\$2,669
Cost per FTE	\$410
Fuel Oil	
Total Fuel Oil Costs ¹	\$6 million
Total Energy Costs	
Total energy costs sum of all winners	\$460 million
Total energy costs / MMBTU ²	\$15
Total energy costs per staffed bed	\$10,661
Total energy costs per licensed bed	\$9,057
Total energy costs per APD	\$27
T-+-	\$3.77
Total energy costs per square foot	

Energy Efficiency

Tables 46 and 47 illustrate the great success Award winning facilities have had with energy efficiency. The data provided in these two tables represents <u>only</u> those facilities that implemented energy efficiency measure and reported data for those projects. 2011 PFC and ELC winning facilities saved 50 million kilowatt hours of electricity and 116,400 dekatherms of natural gas for a total savings of \$8.5 million.

Table 46: Energy Efficiency Executive Summary

Total Energy Savings	Energy Saved	Dollar Savings PFC+ELC		
Electricity	50 million Kilowatt hours	\$7.6 million		
Natural Gas	116,400 dekatherms	\$925,000		
Total Savings		\$8.5 million		
Total GHG emissions prevented	40,300 metric tons CO ₂ ¹			
 Energy efficiency 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). 				

Table 47 highlights details of the electricity savings from projects implemented at our winning facilities; these projects saved over 50 million kilowatt hours of electricity, saving 4 to 5% of annual electricity costs preventing 34,500 metric tons of tons CO2, and generating savings of \$7.6 million! These numbers provide a gross estimate of profits to be made by energy efficiency (not every hospital reported complete dollar and energy savings). Projects most often included upgrades to chillers, lighting, boilers and installing variable speed or variable frequency drives on existing equipment. For a detailed list of projects, please see Appendix 2 to this report.

2011 PFC and ELC winning facilities saved 50 million kilowatt hours of electricity and 116,400 dekatherms of natural gas for a total savings of \$8.5 million.

Energy Efficiency Project details ¹	2011 PFC Winners	2011 ELC Winners	Combined 2011 Savings
Total electricity used in kWh	1.3 billion	636 million	1.9 billion
Total Energy saved in kWh	29 million	21 million	50 million
Total Electricity costs	\$118 million	\$49 million	\$167 million
Total Dollars saved	\$5.7 million	\$1.9 million	\$7.6 million
Average % Annual Electricity Costs Saved	4.9%	3.8%	4.6%
Average kWh saved per Square Foot	0.67	0.96	0.77
Average Savings in dollars per Square Foot	\$0.13	\$0.09	\$0.12

Table 47: Details of Electricity Savings

Table 48 presents detailed data on energy efficiency projects. Note that 96% of ELCs and 92% of PFCs have installed energy efficiency lighting devices, and 91% of ELC and 80% of PFCs have minimized leakage in air handling units and ductwork. For more energy efficiency projects, see Appendix 2.

TREND: Energy efficiency projects listed in Table 48 increased for PFC and ELC winners, with the exception of a few categories. In 2010 there was more of a discrepancy between performance of PFC and ELC winners than is observed in the 2011 results; PFC winners spent the year improving their energy efficiency. ELC winners still outshine the PFC winners in a few areas, but PFC s have done a good job catching up.

Table 48: Energy Efficiency Projects

Energy Efficiency	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Implement building envelope improvements to reduce energy requirements, including, for example, insulation, window and door replacements.	55%	55%	75%	57%
Use evaporative cooling when ambient conditions allow.	32%	43%	54%	65%
Reset space temperatures based on usage and occupancy.	75%	69 %	79%	87%
Operate chiller plants that use various technologies and strategies to reduce overall plant energy consumption at full and partial loads (such as chillers with variable speed drives on the compressors, primary-only variable flow pumping, series- counter-flow chiller arrangements, etc.).	73%	81%	83%	83%
Integrate day-lighting strategies to decrease building energy demand.	56%	49 %	79%	78%

Energy Efficiency	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Utilize chiller optimization program (software) to determine best use of chiller sequencing based on efficiencies at various loads.	61%	68%	88%	70%
Minimize leakage in air handling units and ductwork to reduce overall fan horsepower while ensuring that air is properly filtered.	73%	80%	83%	91%
Retrofit using variable speed drives (VFD's) for motors and pumps, and Energy Star- rated equipment to reduce electrical consumption.	76%	81%	79%	83%
Install energy efficiency lighting devices, such as: LED exit signs, fluorescents, Energy Star qualified lighting fixtures, occupancy sensor and sunlight harvesting controls.	95%	92%	96%	96%
Implemented energy-efficiency retrofits and energy-saving techniques to reduce energy use.		49%		65%
Increased energy efficiency of computer server infrastructure	_	49%		65%
Evaluated or improved critical equipment electrical distribution systems?	_	58%		65%
Other HVAC improvements to improve energy efficiency?	26%	51%	50%	74%

Commissioning remains incredibly important in an overall energy plan, as evidenced in **Table 49**. Some of our most successful hospitals have reported big energy savings from commissioning their existing facility, which does not require huge capital investments. For a listing of specific commissioning projects, see Appendix 2.

TREND: Surprisingly, commissioning decreased slightly in every category; this result could be due to facilities indicating that they were not doing commissioning if they had implemented it previously, but it should be an ongoing program.

OPPORTUNITY: There is a lot of energy and money to be saved through proper commissioning of a building, and making sure everything is running optimally. These projects should be attractive because they do not generally require large capital expenditures, but do generate savings. Practice Greenhealth encourages our winners and all of our members to investigate commissioning their facilities.

Table 49: Commissioning

Commissioning	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Incorporate into the commissioning program regular inspections of the mechanical ventilation system 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.	81%	73	96%	91
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.	74%	70	92%	91
Other Commissioning		12	—	39

Refrigerant management is another important behind the scenes responsibility of facilities managers and an important step to help reduce ozone destruction.

TREND: ELC winners increased in all 3 categories of refrigerant management, but PFC winners decreased in two out of three categories (**Table 50**).

Table 50: Refrigerant Management

Refrigerant Management	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Use non-CFC-based HVAC&R equipment which is often more efficient than CFC-based equipment and can improve overall facility energy performance.	62%	54%	75%	87%
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.")	54%	62%	75%	91%
When reusing existing HVAC systems, conduct an inventory to identify equipment that uses CFC refrigerants and provide a phase out schedule for these refrigerants.	55%	51%	67%	70%

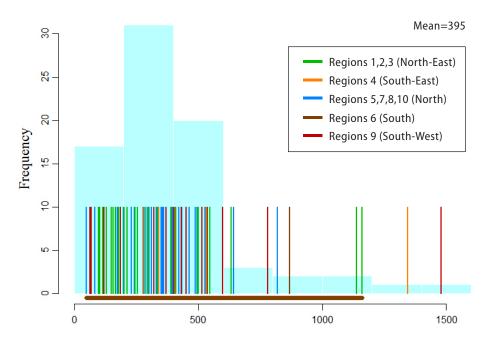
Water

Use and Conservation

Hospitals are often one of the largest water users in a community. While clean drinking water is one of our most valuable resources, water conservation tends to create smaller dollar savings than energy projects, and often doesn't get the attention it deserves. Water conservation tends to have a high profile only in geographic areas where water is scarce, like in the southwestern United States. But often, water in America is considered a cheap, expendable commodity. Costs associated with water will increase.

Our PFC and ELC winners, as a group, used a total of 4 billion gallons of water. When looking at water use and normalization factors, the best correlation was between water use and adjusted patient days (**Figure 14**). However, the R² value for any of the normalization factors was relatively low, which suggests that water use is dependent on another factor or a number of factors. Water is a complicated issue. The average use by PFC facilities was 457 gallons per APD, while the average consumption by ELC facilities was quite a bit lower, at 368 gallons per APD; average for all PFC and ELC winners was 395 gallons per APD. A number of normalization factors are compared in **Table 51**.

Figure 14: Annual Water Use in Gallons per APD



TREND: ELC winners significantly out-performed PFC winners as measured in gallons per APD, the best correlating normalization factor.

OPPORTUNITY: There is an opportunity to learn from the ELC leaders in reducing water use.

Table 51: W	/ater Use
-------------	-----------

Water Use	2009 PFC Winners	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Total gallons used		2.6 billion	4.0 billion	1.3 billion	734 million
Annual gallons used per APD		382	457	375	368
Annual gallons used per staffed bed per day		452	468	388	385
Annual gallons used per Square Foot			62		57
Average gallons used per FTE			21,148		21,286

Water Conservation Activities

Table 52 presents data on water conservation by our Award winners. PFC and ELC facilities that implemented water conservation measures and provided quantitative data saved a total of 162 million gallons of water, or 10% of their total usage, producing a savings of \$610,000.

The percent of facilities that reported implementing water conservation projects dropped significantly between 2010 and 2011, as did the amount of water conserved and the savings gained, even though the facilities were still reaping the benefits of the projects already implemented. However, it should be noted that the water conservation question was updated and changed in 2011 to get more detailed information. Practice Greenhealth did not report on the 2010 data here because we were not able to compare "apples to apples." A number of very profitable projects were listed, with at least one facility saving 24% of their water bill (see below).

TREND: Implementation of new water conservation activities has decreased since last year, with only 41% of PFCs and 52% of ELCs reporting implementation of "recent" water conservation activities. However those facilities that are conserving water are reducing their total water use and their water bills by an average of 10-14%.

OPPORTUNITY: There is definitely an opportunity to save money and water from conservation projects.

Table 52: Water Conservation

(this data is for the group of winners that implemented water conservation projects and provided quantitative data)

Water Conservation	2011 PFC Winners	2011 ELC Winners		
Engaged in recent water conservation projects	41%	52%		
Gallons regular water use	1.2 billion	305.5 million		
Total gallons saved	120 million	41.5 million		
Total dollars saved	\$456,000	\$157,000		
Average % of annual water use conserved ¹	10%	14%		
Water conserved in gallons per APD	27	32		
Savings in dollars per APD	\$0.30	\$0.12		
1) This was calculated as % savings for the group and not by individual facility.				

One large facility did not implement any large water conservation projects that required major capital expenditures, but instead implemented a number of small ongoing initiatives that saved them **24% of their water bill (38 million of 160 million gallons) and associated water and energy savings of \$300,000!** PFC and ELC winners saved a total of 162 million gallons of water, or 10% of their total usage, producing a savings of \$610,000. Tables 53a and 53b illustrate specifically which conservation activities our Award winners are implementing. Some activities were more popular than last year and some were less popular. A few notable increases were observed: 96% of ELCs reduced fixture water usage through automatic controls and other actions; and 65% of ELCs implemented high efficiency irrigation technologies. Two new categories also look promising, as both PFCs and ELCs indicated that they purchased water efficient equipment in the laundry and kitchen, both large water use areas. For more ideas on potable waster use reduction, see Appendix 2. While cooling tower upgrades continue to give big paybacks in water and energy efficiency, Award winners implemented a host of other projects to conserve water, including eliminating the practice of defrosting meat with running tap water, using xeriscaping technologies such as native plants and/or gray water irrigation, **and sub-metering their water use for better tracking**.

Table 53a: Potable Water Use Reduction – Fixtures and Landscaping

Potable Water Use Reduction – Fixtures and Landscaping	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Reduced fixture water usage through automatic controls and other actions.	76%	75%	75%	96%
Specify water conserving plumbing fixtures and fittings that exceed the UPC or IPC fixture and fitting performance requirements in combination with high efficiency or dry fixture and control technologies.	55%	53%	83%	65%
Purchase water efficient equipment in the laundry (washers)?	—	23%	_	43%
Purchase water efficient equipment in the kitchen (washers)?	_	44%	_	57%
Indoor Plumbing Fixture and Fitting Efficiency: Have you:		1	1	1
Reclaimed any potable "grey" water drains, cooling coil condensate, and/or captured rainwater for filtration and treatment to use in non-potable process water needs such as process cooling (sterilizers) or cooling tower water make-up.	6%	8%	17%	22%
Tracked facility's water consumption (for free) using the water tracking feature of U.S. EPA's Energy Star® National Energy Performance Rating System, found within Portfolio Manager at http://www.energystar.gov/benchmark.	21%	17%	17%	13%
Recorded meter and document reclaimed potable water use for further non-potable process use (i.e. cooling tower and boiler water make-up).	15%	13%	21%	22%
Calculated annual fixture potable water use per occupant and per square foot.	11%	12%	25%	9%
Water Efficient Landscaping: Have you:			1	1
Implemented and maintain high efficiency irrigation technologies that include micro irrigation, moisture sensors, or weather data based controllers.	26%	28%	54%	65%
Fed irrigation systems with captured rainwater, gray water (site or municipal), or on-site treated wastewater. Using reclaimed water for selected applications can reduce costs and preserve precious potable water supplies.	5%	7%	17%	26%
Considered eliminating use of an irrigation system. Consider use of xeriscaping principles. Select water efficient, native or adapted, non-invasive climate tolerant plantings.	32%	28%	46%	35%
Other Projects	16%	4%	29%	9%

Table 53b: Potable Water U	se Reduction – Cooling Towers
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Potable Water Use Reduction – Cooling Towers	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Worked with a water treatment specialist to develop a water management strategy addressing the appropriate chemical treatment and bleed-off to ensure proper concentration levels in the cooling tower.	77%	67%	96%	65%
Explored technologies and strategies to eliminate chemical waste to drain in cooling tower and boiler blowdown.	58%	58%	71%	65%
Treated blowdown so that chemical treatment can be reclaimed for re-use.	11%	14%	17%	26%
Implemented a water management plan for the cooling tower that addresses chemical treatment, bleed-off, biological control and staff training for to cooling tower maintenance.	70%	60%	71%	61%
Improved water efficiency by installing and/or maintaining a conductivity meter and automatic controls to adjust the bleed rate and maintain proper concentration at all times.	62%	62%	67%	65%
Employed non-toxic treatment chemicals or chemical-free cooling tower systems.	25%	19%	29%	43%
Used make-up water that consists of at least 50% non-potable water.	3%	14%	4%	13%
Used non-potable makeup water? If so, please list what types of makeup water you have used. (E.G. rainwater, A/C condensate, cooling tower water blow down).	6%	14%	13%	4%
Other Projects	4%	3%	29%	4%

XII. TRANSPORTATION

TREND: Use of alternative transportation continues to be encouraged by our Award winning facilities (Table 54). This year, 36% of PFCs and 61% of ELCs reported having hybrid, electric or alternatively fueled vehicles in their fleets. This shows a real commitment by these hospital administrations to financially support sustainable activities at their facilities. This is also one of the more visible greening activates, which naturally draws people's attention to sustainable actions implemented by the hospital. Two additional activities listed as "other incentives" included: Funded and built bicycle parking lot, and initiated a "Ride Your Bike To Work Day."

OPPORTUNITY: There is still some room for growth in alternative transportation. For example, carpooling was down significantly in the PFC hospitals and the majority of facilities do not reimburse for public transportation (although this may be a factor of rural hospitals not having that opportunity due to a lack of public transportation).

Alternative Transportation	2010 PFC Winners	2011 PFC Winners	2010 ELC Winners	2011 ELC Winners
Have hybrid, electric or alternative fueled vehicles in our fleet	_	36%	_	61%
Reimbursed public transportation fees	35%	42%	38%	43%
Organized car pools	61%	45%	67%	70%
Made bike racks available	82%	90%	100%	100%
Provided locker rooms and shower facilities	69%	80%	92%	91%
Offered shuttle services to/from public transportation and/or between our facilities	48%	56%	58%	70%
Providing desired parking for carpools or owners of hybrid cars	35%	26%	54%	61%
Encouraged teleconferencing instead of meetings	82%	88%	67%	83%
Encouraged carpooling to offsite classes and meetings	76%	81%	71%	87%
Offered other incentives (e.g. free lunches)	25%	31%	38%	48%

Table 54: Alternative Transportation

4.0 CONCLUSIONS

Practice Greenhealth Award winners are saving **over \$43 million dollars a year**. Table 55 presents some rather dramatic totals of savings achieved by the combined 2011 PFC and ELC Award Winners. Note the equivalency results for CO₂ reductions below.

Table 55: Summary of Savings for 2011 Award Winners

Savings From:	Amount of Waste Diverted or Prevented 2011	Dollars Saved 2011	Table in 2011 Report
Recycling	63,000 tons	\$19 million in disposal fees ¹	_
SUD Reprocessing	320 tons	\$11.75 million	Table 16
Reusable Sharps Container Programs	1625 tons	\$2.0 million	Table 17
Solvent Distillation	51,807 gal distilled 38,220 gal reused	\$860,000	Table 28
Electricity	50 million kWh =34,480 metric tons CO ₂ ²	\$7.6 million	Table 46
Natural Gas	116,400 dekatherms = 5,820 metric tons CO ₂ ²	\$925,000	Table 46
Water	162 million gallons saved	\$610,000	Table 52
TOTAL		\$ 43 million	

1) Recycling and diversion programs saved \$19 million in avoided solid and hazardous waste disposal fees. This data does not include additional savings from recycling construction and demolition debris.

2) Please note: The Greenhouse Gas Equivalencies Calculator uses the Emissions & Generation Resource Integrated Database (eGRID) U.S. annual non-baseload CO₂ output emission rate to convert reductions of kilowatt-hours into avoided units of carbon dioxide emissions. Most users of the Equivalencies Calculator who seek equivalencies 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). Emission Factor = 7.18 x 10⁻⁴ metric tons CO₂ / kWh.

Equivalency results*

The savings from 50 million kilowatt hours of electricity plus 116,400 dekatherms of natural gas is equivalent to any **one** of the following:

- Annual greenhouse gas emissions from 7,900 passenger vehicles;
- CO₂ emissions from **4,517,990 million gallons of gasoline consumed**;
- CO₂ emissions from **97,716 barrels of oil consumed**;
- CO₂ emissions from the **electricity use of 5,025 homes** for one year;
- Carbon sequestered by **1,033,276 tree seedlings** grown for 10 years;
- Carbon sequestered annually by **7,410 acres of pine** or fir forests;
- CO₂ emissions from **1,682,074 million propane cylinders** used for home barbeques.

* SOURCES:

- US EPA Clean Energy website: http://www.epa.gov/cleanenergy/
- Electricity use (kilowatt-hours): http://www.epa.gov/cleanenergy/energy-resources/refs.html
- Greenhouse Gas Equivalencies Calculator (updated March 2010): http://www.epa.gov/cleanenergy/energy-resources/calculator.html#results
- Please note: The Greenhouse Gas Equivalencies Calculator uses the Emissions & Generation Resource Integrated Database (eGRID) U.S. annual non-baseload CO₂ output emission rate to convert reductions of kilowatt-hours into avoided units of carbon dioxide emissions. Most users of the Equivalencies Calculator who seek equivalencies 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). Emission Factor = 7.18 x 10-4 metric tons CO₂/ kWh.

Summary

Practice Greenhealth Award winning hospitals continue to lead the sector in innovation regarding sustainability in health care. From some of the smallest to some of the largest hospitals in the nation, these Award winners are pushing the envelope to reduce waste, conserve water and energy, save money, and make their facilities healthier for staff, patients and guests alike. And while this report represents a snapshot of sustainability activity among our Award winning hospitals, Practice Greenhealth wishes to acknowledge the ongoing efforts of **all** of our members to reduce the environmental impact of their operations.

It is encouraging to see a trend of continuous improvement in sustainable activities for many areas evaluated in this Report from 2009 to 2011 for both PFC and ELC winners. In some areas PFCs are closing the gap between their performance and the ELCs performance; in other areas, the ELC winners clearly outperformed the PFC winners, once again raising the bar for excellence in health care. Practice Greenhealth hopes that facilities will use this report, as well as the Partner for Change/Environmental Leadership Circle Award Application to gauge performance, and create a "to do" list for their continuation along the journey towards sustainability.

Practice Greenhealth would like to thank each of the Partner for Change and Environmental Leadership Circle Award Winners who collected and submitted the data for this lengthy Award application, without whom this report would not have been possible.

We would like to extend a special thank you to Eugene Demidenko and D. Christopher Hill for statistical and mathematic analyses, respectively.

Eugene Demidenko, Ph.D. has worked in biostatistics and biomedical research for 20 years. He is a Professor at the Section of Biostatistics and Epidemiology, at Dartmouth Medical School in Lebanon, NH and teaches statistics at the Department of Mathematics at Dartmouth College, also in Hanover, NH. His own research on electrical impedance tomography for breast cancer detection, funded by NIH, is performed in collaboration with engineers at Dartmouth College's Thayer School of Engineering where Demidenko holds the title of Adjunct Professor. He has published three books on statistics and more than 100 papers in peer-reviewed journals.

D. Christopher Hill, Ph.D. received his PhD in acoustics from Cambridge University in Cambridge, England and has worked in applied mathematics and computational fluid dynamics for 25 years. He has worked or consulted for the British Royal Navy, NASA Ames, and the Center for Turbulence Research at Stanford University and is currently a principal engineer at Ansys, Inc. in Lebanon, NH.

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, we can't guarantee that all of the data presented herein is flawless.

Appendix 1 – **Graphs and Histograms**

This Appendix presents additional graphs and histograms that are not presented in the main body of the Sustainability Report. These figures are complementary to that main document.

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SINGLE USE DEVICE REPROCESSING (SUDs)

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	Vaste Prevented	.86
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	Waste Diverted Annually through SUD Reprocessing	06
	perating room)	00
	Annual Savings from Single Use Device Reprocessing	07
	affed bed)	8/
5	Annual Savings from Single Use Device Reprocessing	07
	2D) Annual Savings from Single Use Device Reprocessing	0/
	perating room)	88
REUSABLE SHARPS	CONTAINERS -	
	/aste Prevented	.89
	Waste Diverted Annually through Reusable Sharps Container	
	nds per staffed bed)	89
	Waste Diverted Annually through Reusable Sharps Container	
	nds per APD)	89
	Waste Diverted Annually through Reusable Sharps Container	
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Histogram 57. Total Energy Costs per License Bed	
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Graphs and Histograms

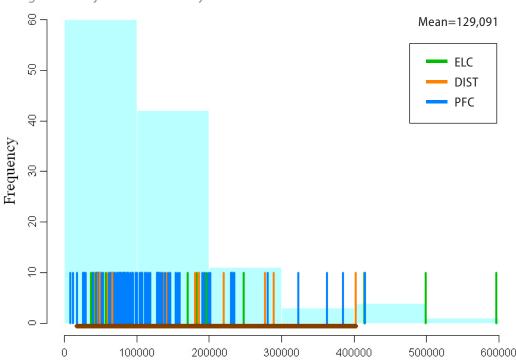
How to Interpret the Histograms

Histograms are a graphical method to represent the distribution of data. Typically, a histogram divides the range of the data (from minimum to maximum) into equal width "bins" and displays the number of data points within each bin as a rectangle; the height of the rectangle equals the frequency, or number of occurrences.

For example in the Adjusted Patient Days (APD) histogram immediately below, there are 60 hospitals with APD < 100,000 (left most rectangle), 40 hospitals with APD between 100,000 and 200,000 (second rectangle) and only ten hospitals with APD between 200,000 and 300,000 (third rectangle). The individual hospitals are represented anonymously by Award won, with blue lines denoting PFC winners, orange lines denoting DIST winners and green lines denoting ELC winners.

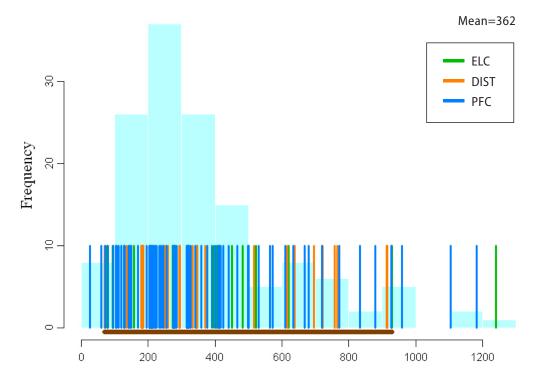
The mean, or average value, for the entire data set is represented above the color key; in the example the mean is 129,091 APD. The underlying brown segment just above the x axis (horizontal axis) represents 95% of the data (2.5% to the left and 97.5% to the right). Hospitals outside the 95% interval can be considered outliers.

The Data Set

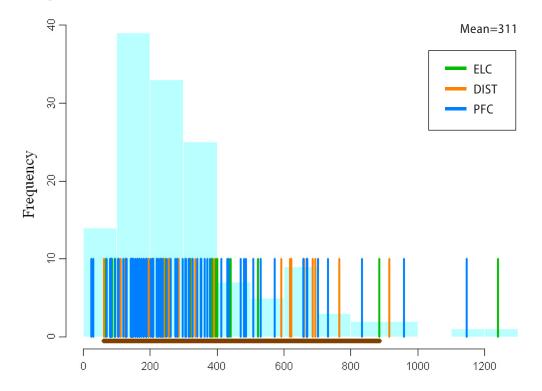


Histogram 1. Adjusted Patient Days

Histogram 2. Number of Licensed Beds

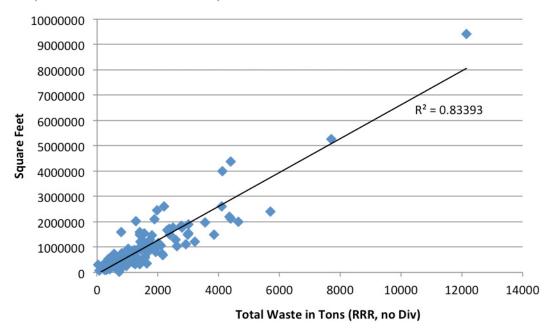


Histogram 3. Number of Staffed Beds

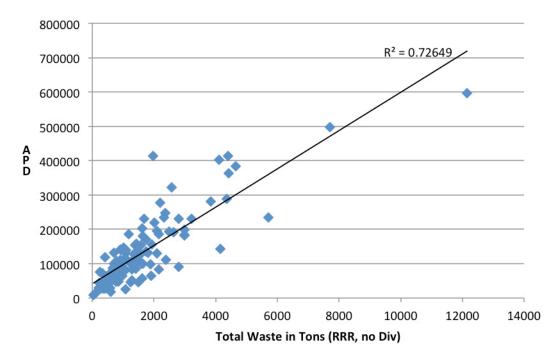


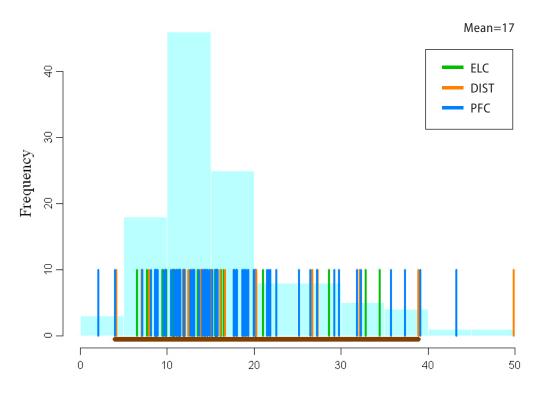
ANNUAL WASTE GENERATION

Graph 1. Total Waste in Tons vs. Square Feet



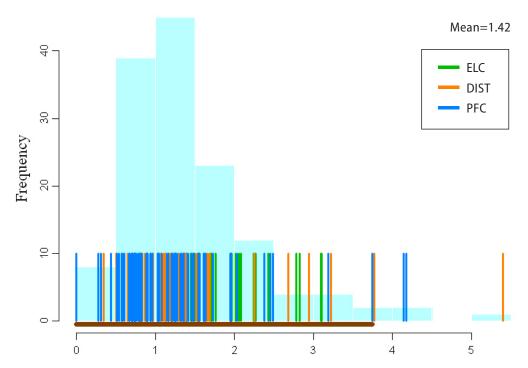
Graph 2. Total waste in Tons vs. APD



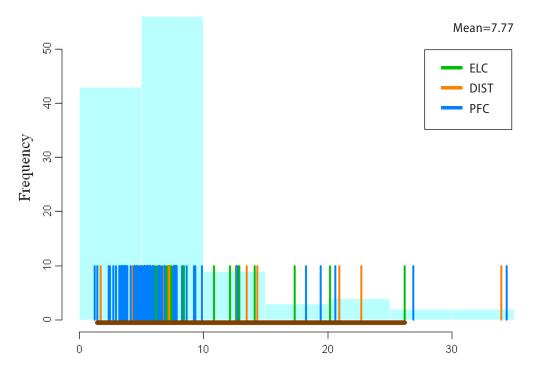


Histogram 4. Annual Solid Waste Generation (pounds per APD)

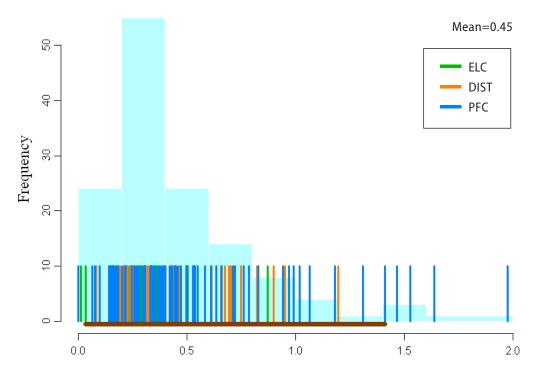
Histogram 5. Annual Total Recycling or Diverted Waste (tons per staffed bed) includes universal waste



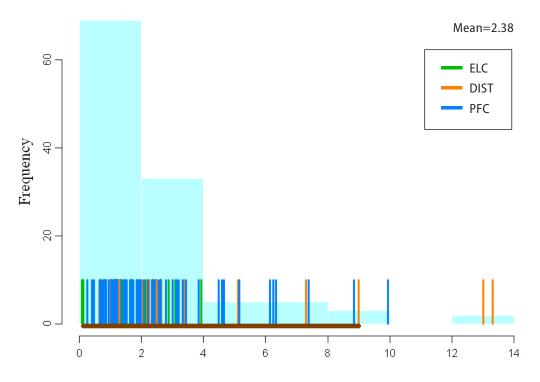
Histogram 6. Annual Total Recycling or Diverted Waste (tons per APD) includes universal waste



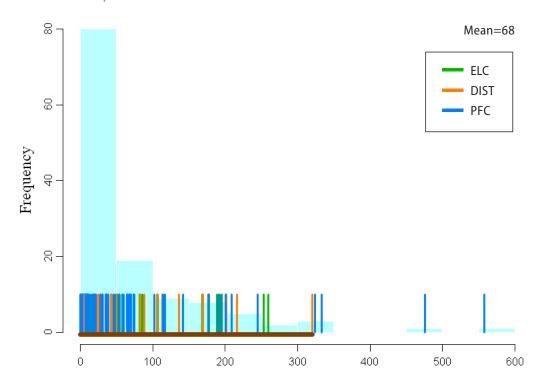




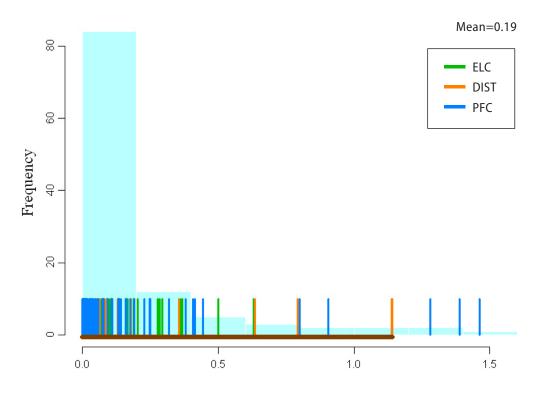
Histogram 8. Annual Total RMW Generation (pounds per APD) includes pharmaceutical waste



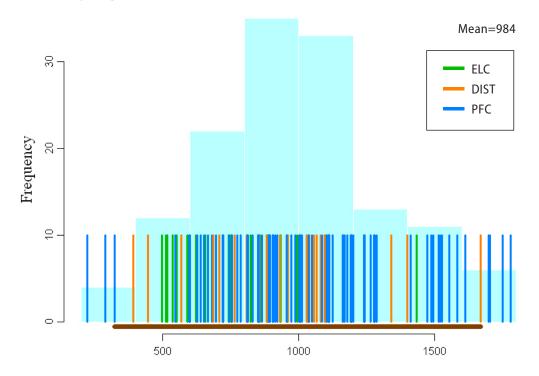
Histogram 9. Annual Total Hazardous Waste Generation (pounds per staff bed) includes RCRA pharmaceutical waste



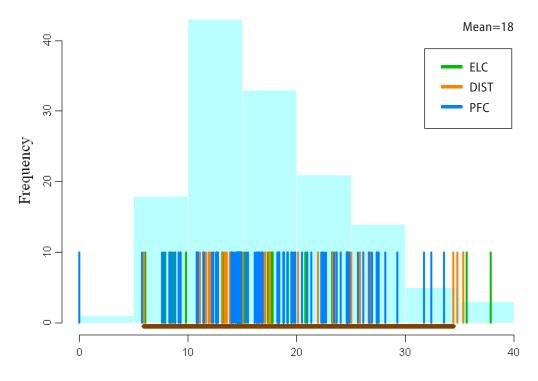
Histogram 10. Annual Total Hazardous Waste Generation (pounds per APD) includes RCRA pharmaceutical waste



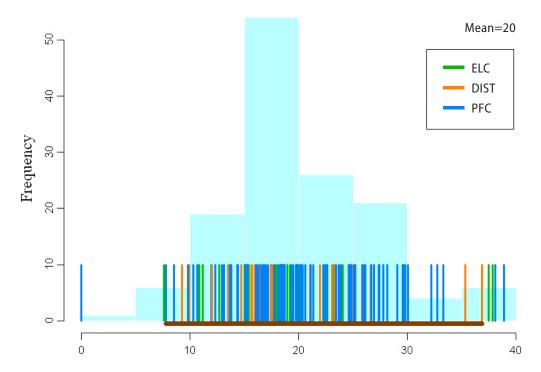
Histogram 11. Total Annual Waste Generation (pounds per employee, FTE) does not include recycling



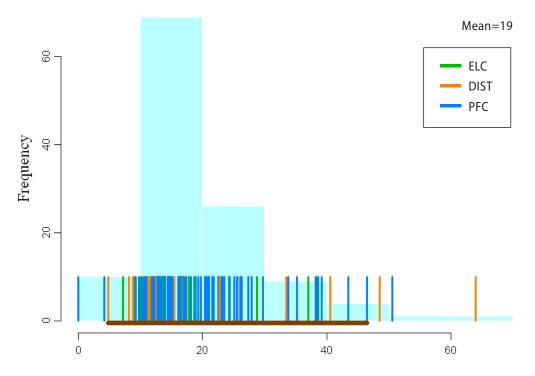
Histogram 12. Total Waste Generation (pounds per licensed bed per day) does not include recycling



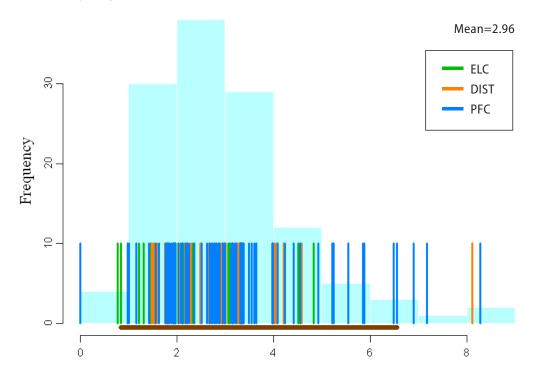
Histogram 13. Total Waste Generation (pounds per staffed bed per day) does not include recycling



Histogram 14. Total Annual Waste Generation (pounds per APD) does not include recycling

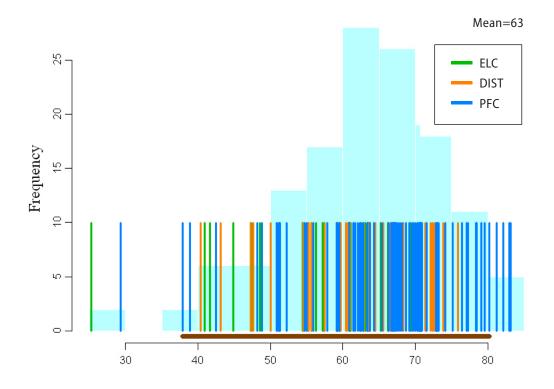


Histogram 15. Total Annual Waste Generation (pounds per square foot) does not include recycling

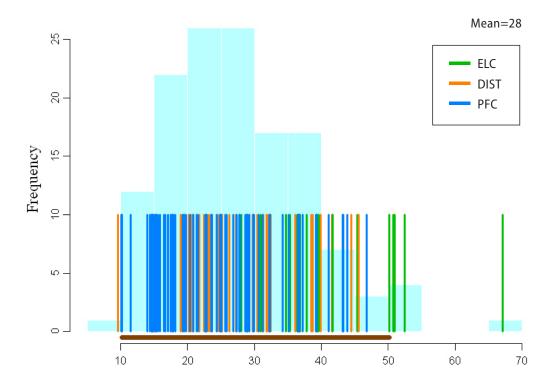


PERCENT (%) OF TOTAL WASTE GENERATION

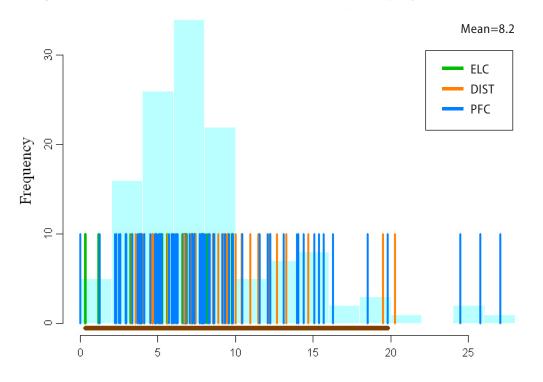
Histogram 16. Percent Solid Waste Generation (of total waste per year)



Histogram 17. Percent Recycling and Diversion (of total waste per year)

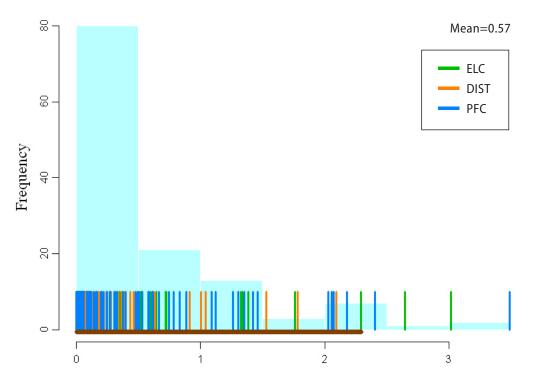


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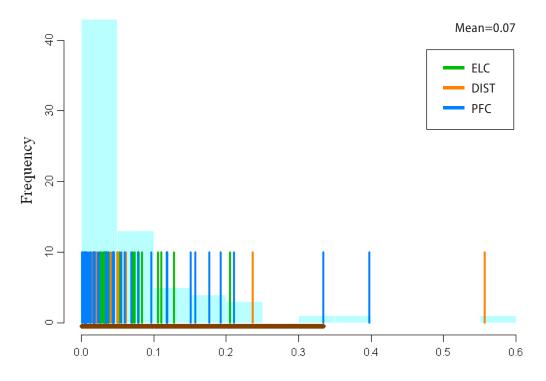
Histogram 18. Percent RMW Waste Generation (of total waste per year)

Histogram 19. Percent Hazardous Waste Generation (of total waste per year)

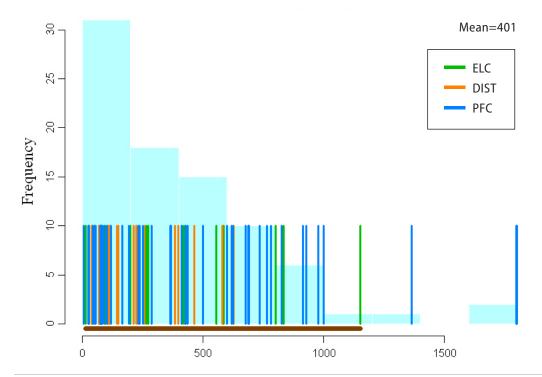


SINGLE USE DEVICE REPROCESSING (SUDs) – Savings and Waste Prevented

Histogram 20. Waste Diverted Annually through SUD Reprocessing (pounds per APD)

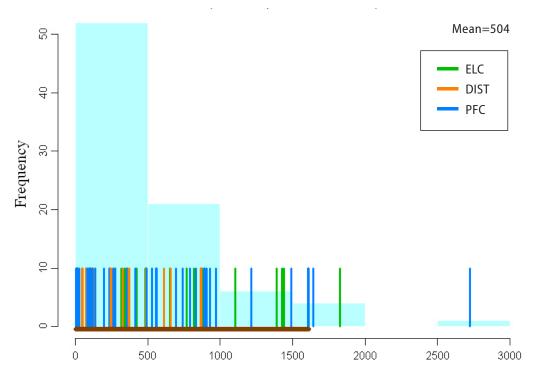


Histogram 21. Waste Diverted Annually through SUD Reprocessing (pounds per operating room)

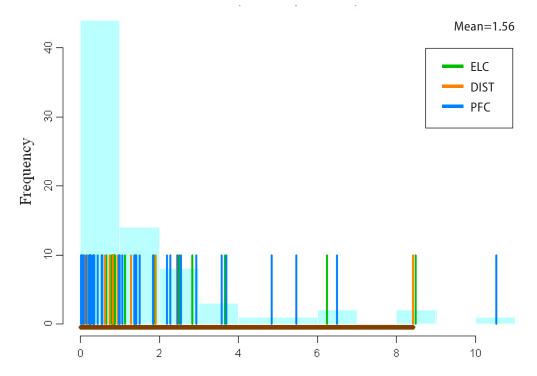


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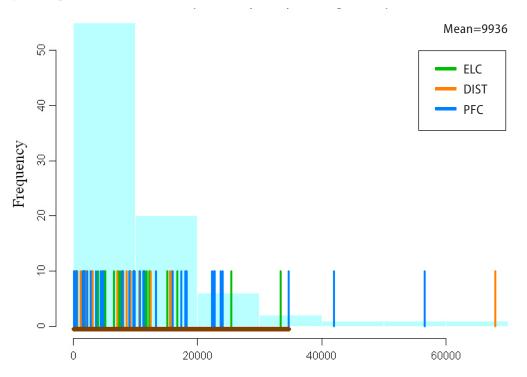
Histogram 22. Annual Savings from Single Use Device Reprocessing (dollars per staffed bed)



Histogram 23. Annual Savings from Single Use Device Reprocessing (dollars per APD)

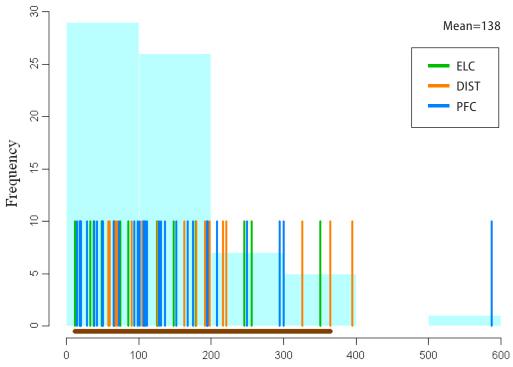


Histogram 24. Annual Savings from Single Use Device Reprocessing (dollars per operating room)

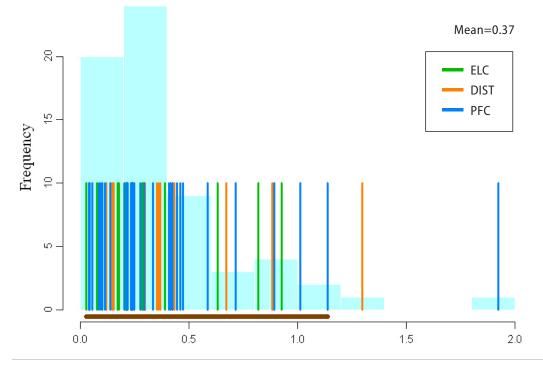


REUSABLE SHARPS CONTAINERS – Savings and Waste Prevented

Histogram 25. Waste Diverted Annually through Reusable Sharps Container Program (pounds per staffed bed)

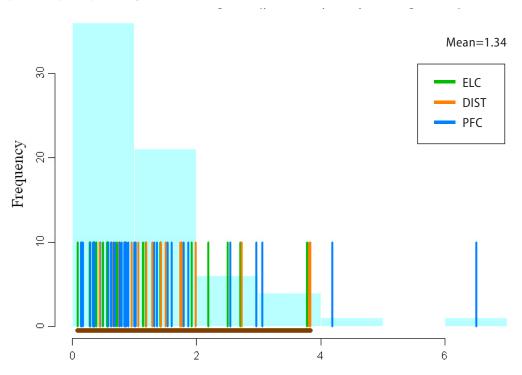


Histogram 26. Waste Diverted Annually through Reusable Sharps Container Program (pounds per APD)

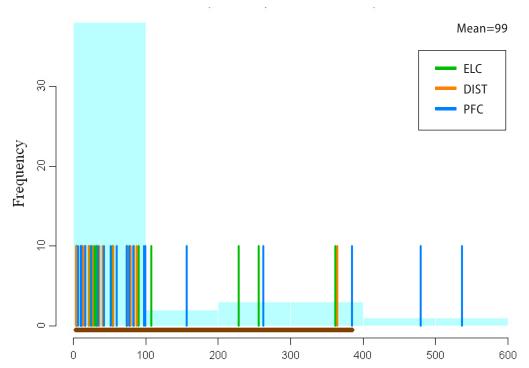


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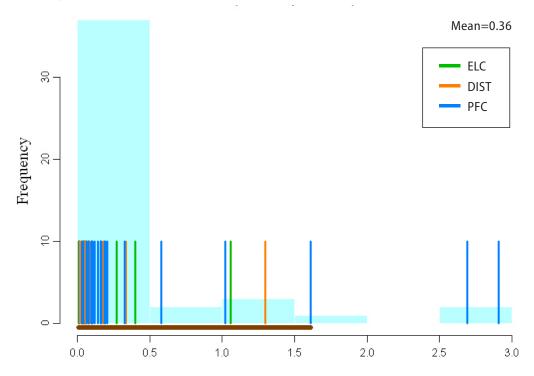
Histogram 27. Waste Diverted Annually through Reusable Sharps Container Program (pounds per operating room)



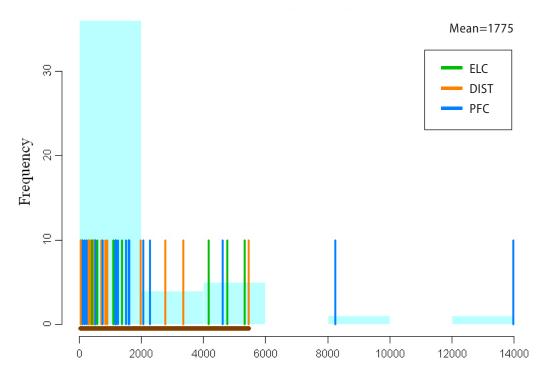
Histogram 28. Annual Savings from Reusable Sharps Container Program (dollars per staffed bed)



Histogram 29. Annual Savings from Reusable Sharps Container Program (dollars per APD)



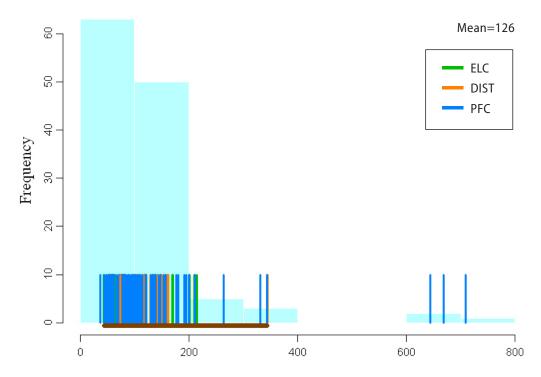
Histogram 30. Annual Savings from Reusable Sharps Container Program (dollars per operating room)



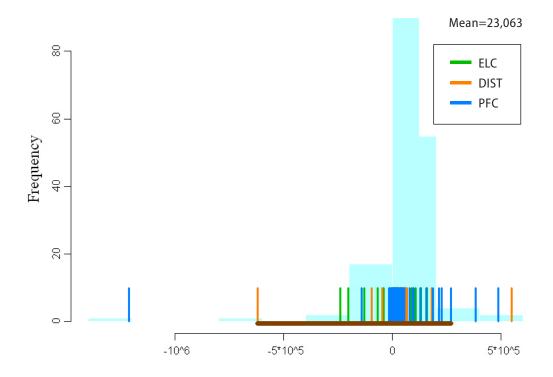
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ANNUAL WASTE COSTS

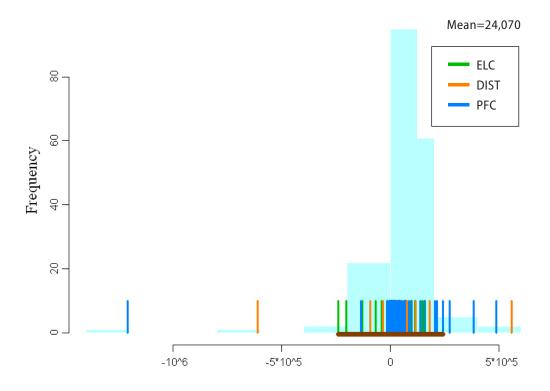
Histogram 31. Annual Solid Waste Disposal Costs (dollars per ton)



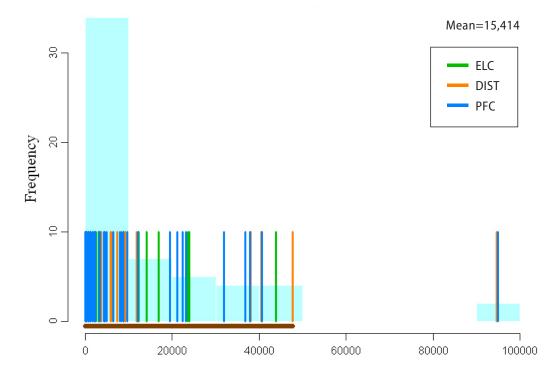
Histogram 32. Annual Costs or Savings from Recycling (does not include universal waste) negative numbers indicate savings



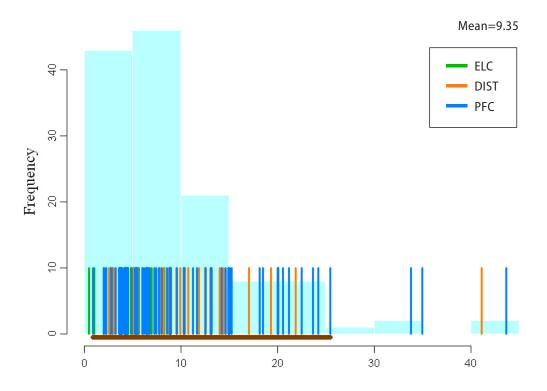
Histogram 33. Annual Costs or Savings from Recycling (includes universal waste) negative numbers indicate savings



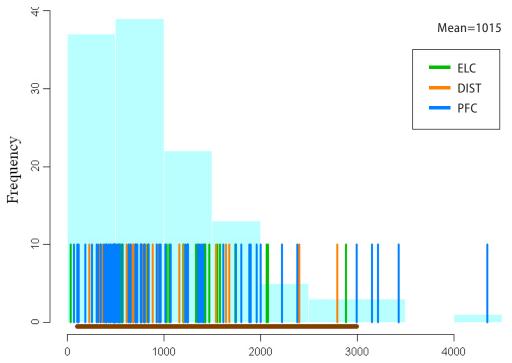
Histogram 34. Annual Costs for Non-hazardous Pharmaceutical and Pathology Waste



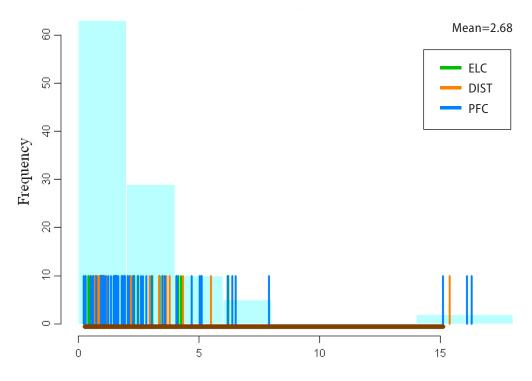
Histogram 35. Annual Total Regulated Medical Waste Costs per Operating Room; includes pharmaceutical waste



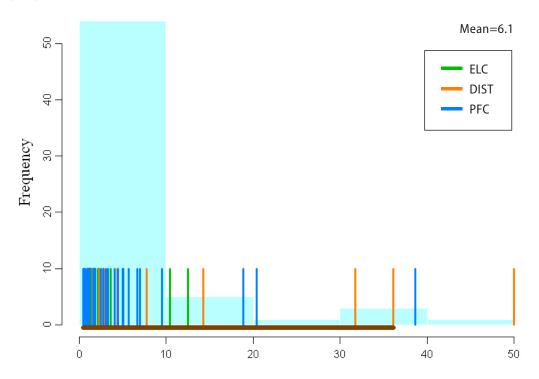
Histogram 36. Annual Total Regulated Medical Waste Costs per Ton; includes pharmaceutical waste



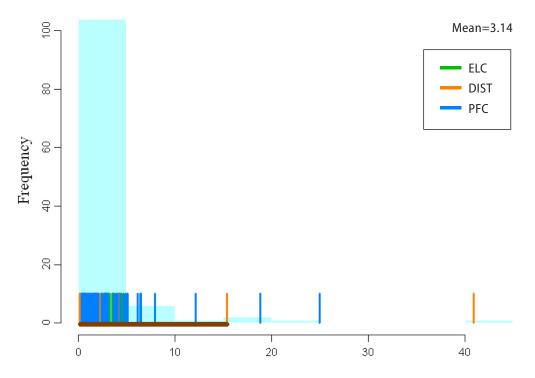
Histogram 37. Annual Hazardous Waste Costs (dollars per pound) does not include pharmaceuticals



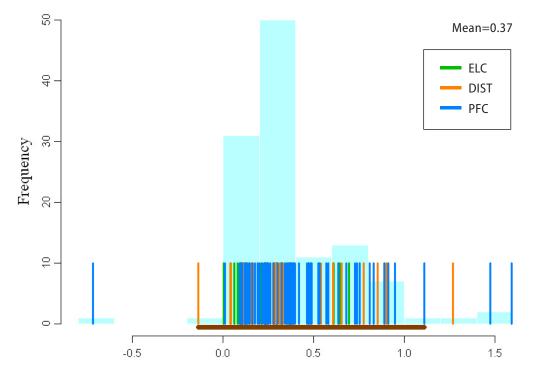
Histogram 38. Annual RCRA Regulated Hazardous Pharmaceutical Waste Costs (dollars per pound)



Histogram 39. Annual Total Hazardous Waste Costs (dollars per pound) includes RCRA regulated pharmaceutical waste



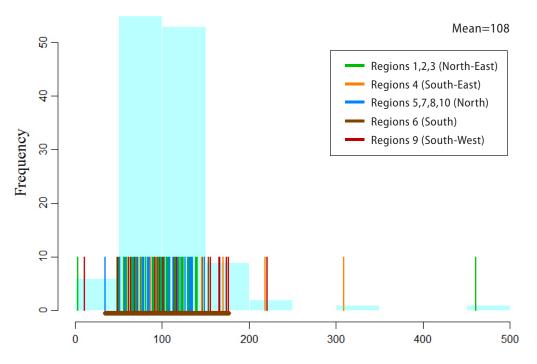
Histogram 40. Total Annual Waste Costs per Square Foot (for all types of waste disposal and recycling



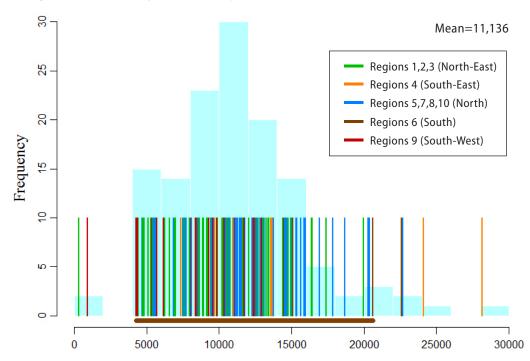
ENERGY

Electricity

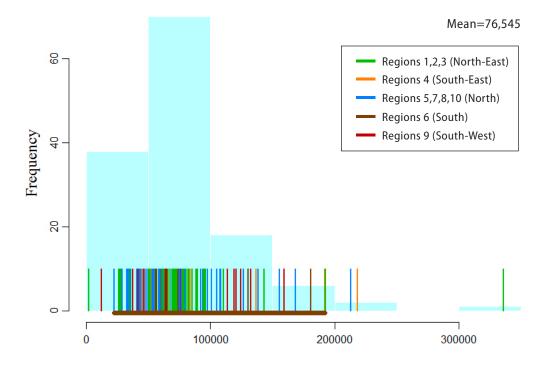
Histogram 41. EUI (Energy Use Intensity) for Electricity (= kilowatt hours x 3.415 per square foot)



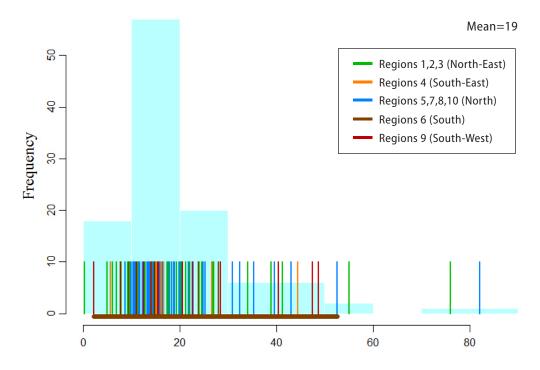
Histogram 42. Electricity Use in kWh per FTE



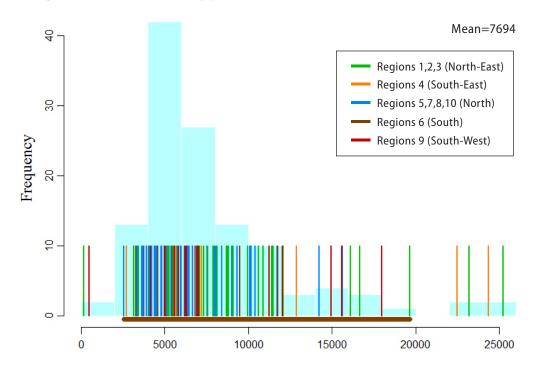
WWW.PRACTICEGREENHEALTH.ORG



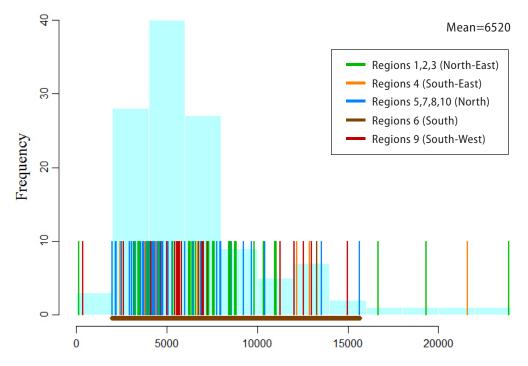
Histogram 44. Cost of Electricity per APD



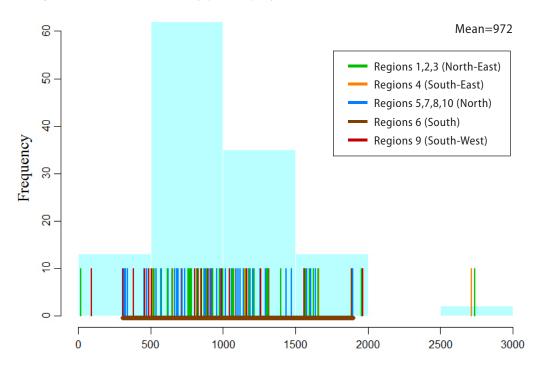
Histogram 45. Cost of Electricity per Staffed Bed



Histogram 46. Cost of Electricity per Licensed Bed

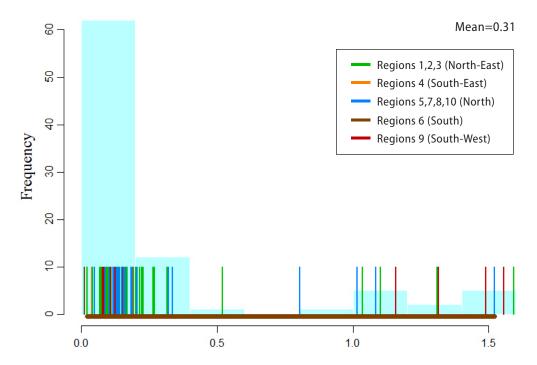


Histogram 47. Cost of Electricity per Employee (FTE)

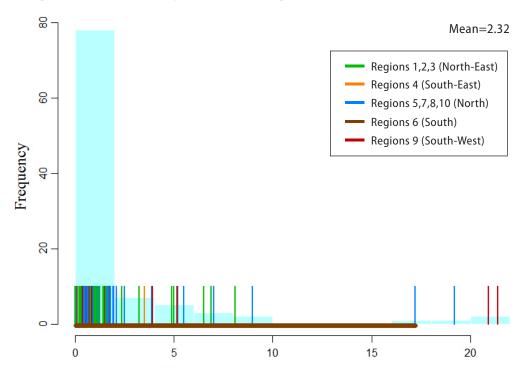


Natural Gas

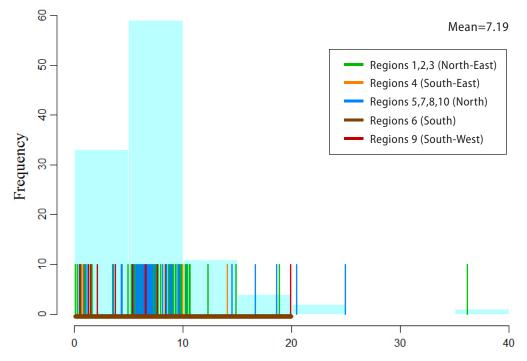
Histogram 48. Dekatherms per Square Foot (natural gas)

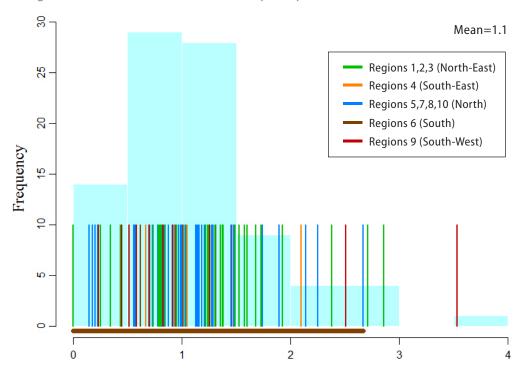


Histogram 49. Dekatherms per APD (natural gas)

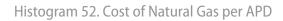


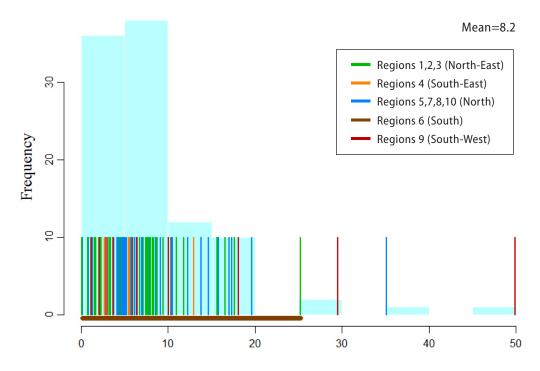
Histogram 50. Annual Cost of Natural Gas per Dekatherm

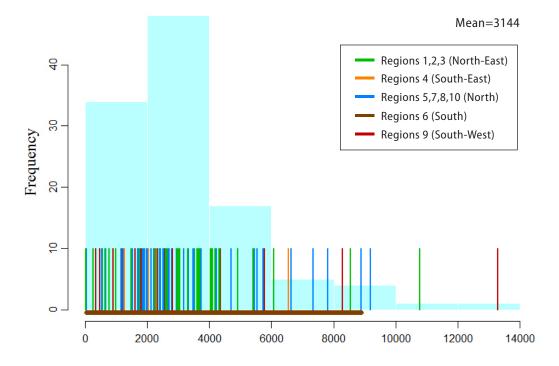




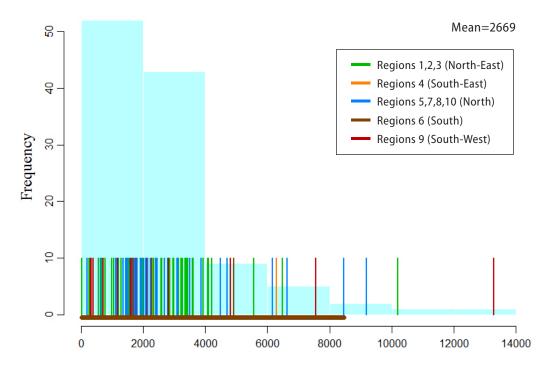
Histogram 51. Annual Cost of Natural Gas per Square Foot



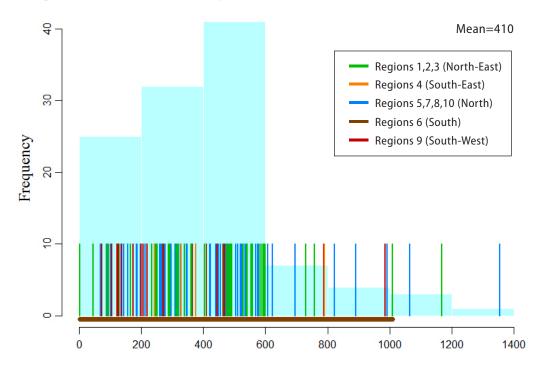




Histogram 54. Cost of Natural Gas per Licensed Bed

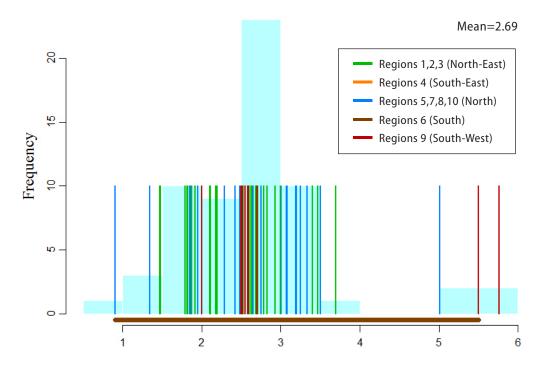


Histogram 55. Cost of Natural Gas per FTE



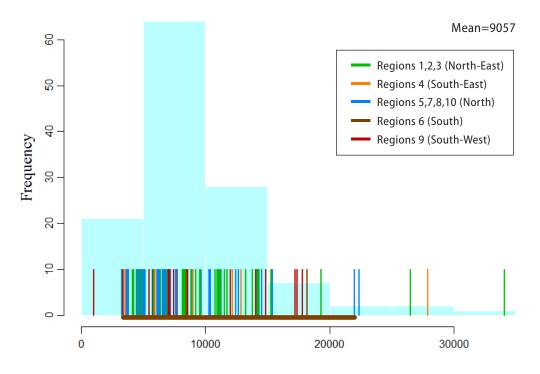
Fuel Oil

Histogram 56. Cost of Fuel Oil per Gallon

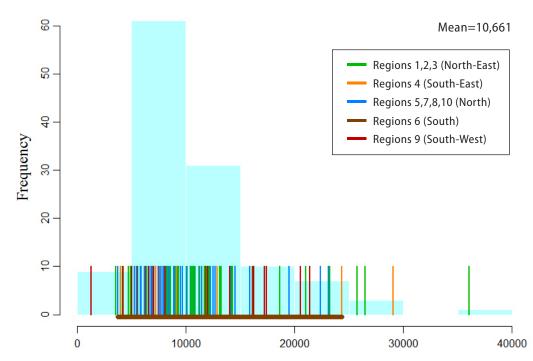


Total Energy Costs

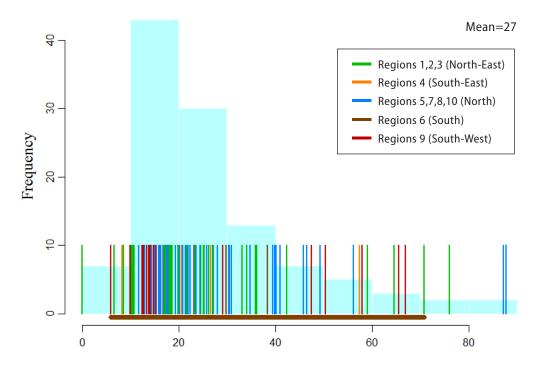
Histogram 57. Total Energy Costs per License Bed



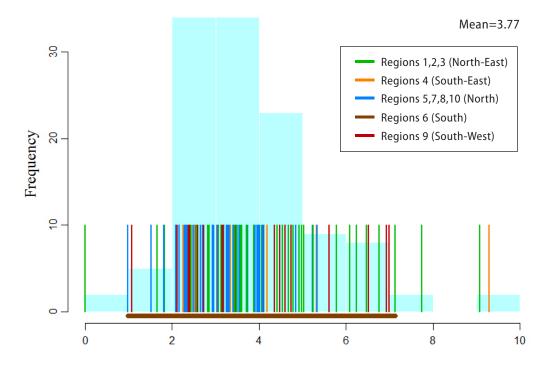
Histogram 58. Total Energy Costs per Staffed Bed

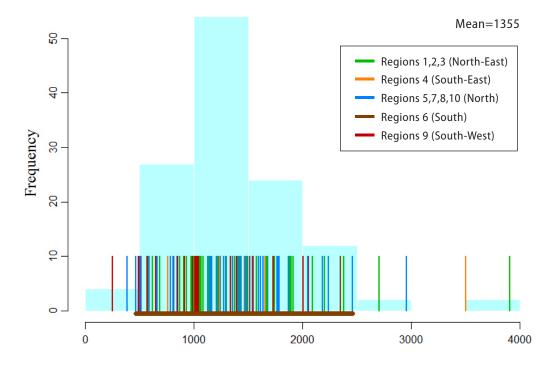


Histogram 59. Total Energy Costs per APD

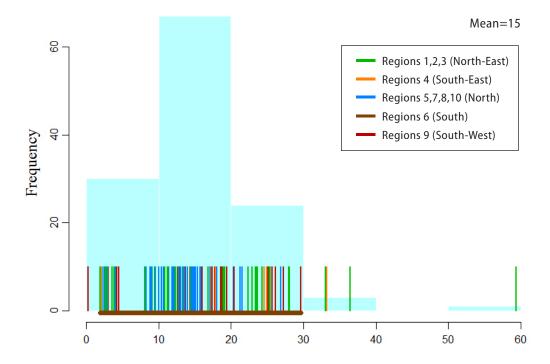


Histogram 60. Total Energy Costs per Square Foot



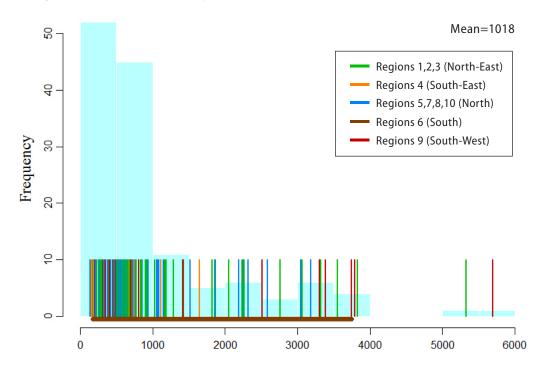


Histogram 62. Total Energy Costs per Million Btu (for all energy types)

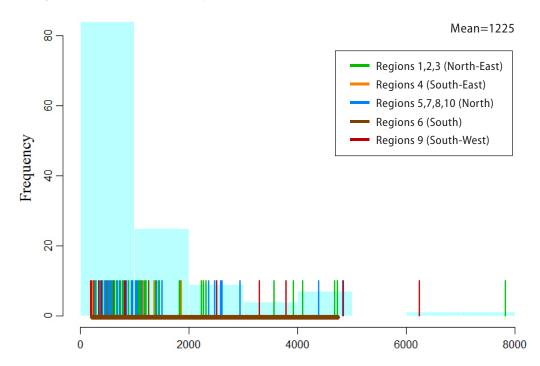


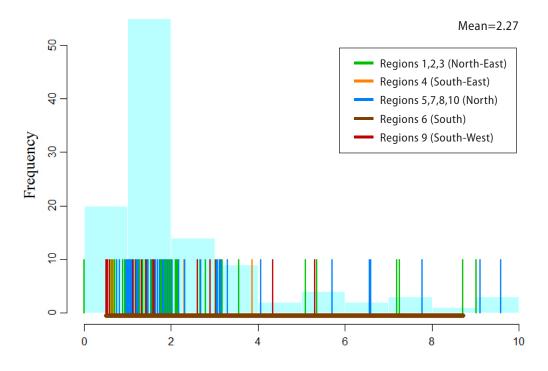
Total Annual Energy Use

Histogram 63. Total Million Btu per Licensed Bed

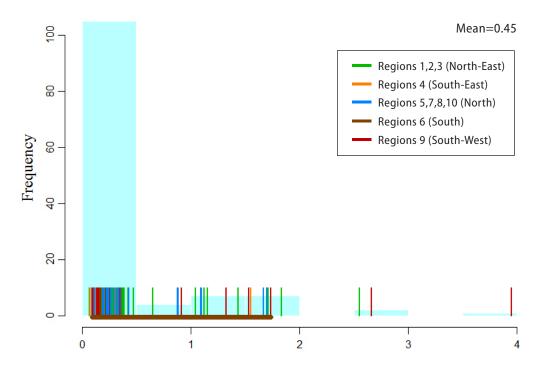


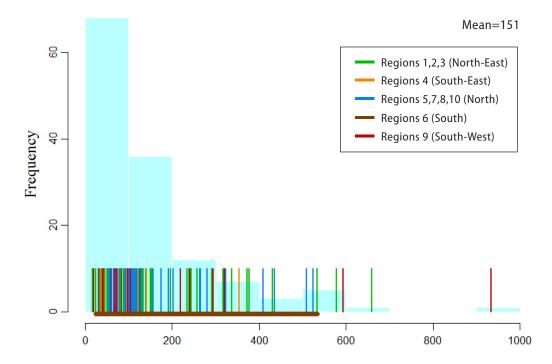
Histogram 64. Total Million Btu per Staffed Bed





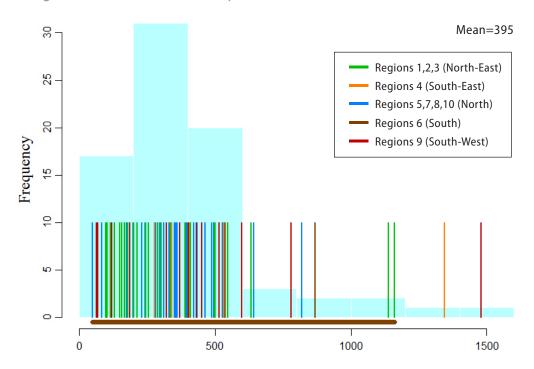
Histogram 66. Total Million Btu per Square Foot



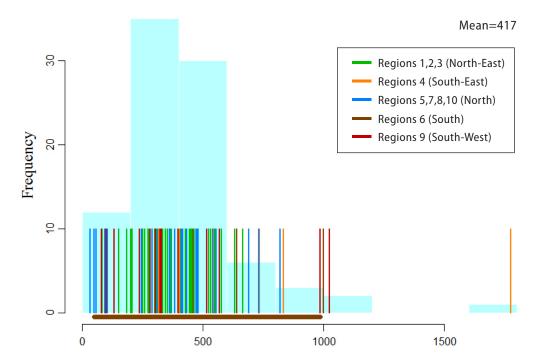


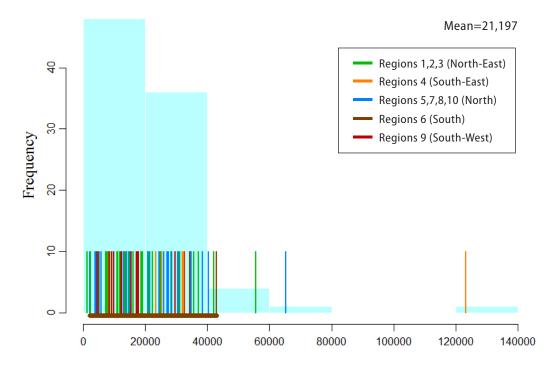
WATER

Histogram 68. Water Use in Gallons per APD

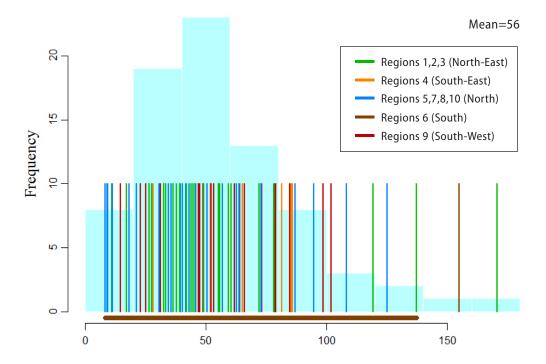


Histogram 69. Water Use in Gallons per staffed bed per day





Histogram 71. Water in Gallons per Square Foot



Appendix 2 – Additional Projects Implemented

This Appendix contains the additional sustainability projects implemented by our Award winners that are not already listed in various tables in the Partner for Change Award application. These are the projects that were designated as "other" at the very end of a few specific tables in the Award application. There are many innovative and very reproducible ideas in these tables below; please take a minute to look for ideas that you could implement at your facility.

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I. SUSTAINABILITY AND ENVIRONMENTAL INFRASTRUCTURE

Supplement to Table 2: Sustainable Activities In-house

II. A CULTURE OF SUSTAINABILITY

Supplement to Table 5: Leadership within the Local Community Supplement to Table 6: Leadership in the Health Care Sector

XI. FACILITIES AND CONSTRUCTION

Supplement to Table 48: Energy Efficiency Projects Supplement to Table 49: Commissioning Supplement to Tables 53a and 53b: Potable Water Use Reduction

I. SUSTAINABILITY AND ENVIRONMENTAL INFRASTRUCTURE

Supplement to Table 2: Sustainable Activities In-house

Added healing environment to strategic plan as an organization value	
Added sustainable food to community report	
Affixed Green labels to electric light switches to be turned off	
Provided annual sustainability updates to Board of Directors	
Applying for "LEED Gold" status for the new Radiation Oncology Building	
April Grand Rounds discussed the possible connection of Air pollution and Cardiovascular disease	
As an active member, the Deputy Chief of Administration (DCA) attended quarterly Sustainability Board and Environmental Management System ISO 14001 meetings with other Army Leaders as members	
As part of our written goals, our goal is to become a Sustainable hospital Financially, Environmentally and Strat	egically
Were presented an Environmental Steward Award	
CEO included sustainability initiatives in "Keeping You Informed" emails that go to all employees and get publis our newsletter that goes out to thousands	hed in
Community New Vision Activities provide a strategic plan to focus on healthy communities and the environme	nt
Conducted a recycling audit for high generating departments	
Created three organic vegetable and herb gardens	
Created a monthly Green Standard sustainability focus with programming and educational materials (for empl and visitors) to go with each month's theme	oyees
Created a senior level sustainability director position, which reports directly to the President/CEO	
Created new drop off stations for electronic waste	
Created PLANET Award for leadership to nominate departments that are demonstrating positive, creative behave related to sustainability	viors
Created garden for staff and community education	
Currently building a 128 square foot herb garden on our main campus. Will use herbs in cafeteria and catering, received from county health department to use/sell any herbs grown on site. Will use as an educational site for on-site Early Childhood Education Center which serves 250+ children per day	
Developed a consistent data capture/reporting tool to accurately identify various wastes, track total waste and	costs
Developed a quarterly award for reduction of RMW waste concerns on the floor	
Developing a culture of sustainability within the Real Estate & Support Services Division. Departments engage include: Facilities, Environmental Services, Design & Construction, Materials Management, Safety, Security, Nutr Clinical Engineering, Transportation	
Displayed Green Posters in Public Areas	
Discussed Green Procurement with Medical Staff	
Created Employee Vegetable Gardens	
Initiated empty pharmacy waste glass recycling	

Supplement to Table 2: Sustainable Activities In-house

ncluded Environmental Health in nursing competencies on postpartum and antepartum units	
stablished "Green Mondays"- no office supplies are delivered on that day	
stablished sustainability metrics in annual corporate priorities	
stablished sustainable garden beds for local produce production & education	
unded and built bicycle parking lot; Initiated Ride your Bike to Work day	
ncluded Green goals on all leaderships evaluations for 2010	
lealing garden is in plans for new LEED hospital and have started the work	
lired Consultants to train staff on Waste Management/Recycling initiative	
lospital Commander conducts monthly award ceremonies and has recognized selected employees who've m ignificant contributions toward greening the hospital environment	nade
losted a large scale Earth Day event with over 30 exhibitors and 7000 attendees	
dentified sustainability as a Core Value in our Strategic Plan	
mplemented an inpatient room recycling pilot program	
ncluded sustainability in Community Benefit report to community (online and in print)	
ncluded sustainability statement in Children's Hospital information guide	
abeled electric light switches to be turned off	
Dur Strategic Plan for sustainability includes short and medium goals annually. Our goal is to try to include as ustainable re-construction as possible	much
articipated in the Green Teams Peer Group on our internal version of FaceBook	
nclude PGH initiatives in corporate Greening Summit	
articipated in space planning committee	
ost green updates on Facebook and Twitter	
resented at Leadership meetings	
resented to hospital advisory board. Presented to corporate leadership and other facilities	
resented to regional corporate leadership team. Encouraged our Health System to adopt sustainability as a sy vide goal	ystem
losted Practice Greenhealth sustainability training at our sister facility. Hosted community medication take ba event (initiated by hospital leadership)	ack
resident emailed a paper reduction pledge to all staff and the facility saw a 10% paper reduction	
provided all new employees with a Green Team overview (on new hire CD) describing Green Team mission, ommitment to sustainability, and past, current and future activities/actions	
Provided an annual Environmental of Care Fair	
provided ice packs to "meals on wheels" as a community service	
eld raffle drawing for bicycle on Earth Day	
Received the Baby friendly designation sponsored by the World Health Organization and the United Nations Thildren's Fund	

Supplement to Table 2: Sustainable Activities In-house

Provide Recycling for employees

Researching large scale Solar Power

Overcame hurdles around recycling. With a lot of persistence, we are now recycling with the help of a nonprofit who provides meaningful employment to adults with disabilities

Installed Rooftop Garden in new building

Routinely shared environmental efforts through internal communications channels (intranet, email, meeting announcements, etc.)

Senior leaderships bonus was tied to achieving goals

Sent two employees to Greening the OR Symposium. Hosted a PGH Sustainability Training at hospital and sent 8 employees. Submitted a webinar proposal for PGH series. Endorsed HHI Agenda

Created video highlighting our sustainable initiatives; video shown at new employee orientation, shared with other system hospitals and shown at annual system leadership conference

Shared FY results at leadership meeting with an audience of approximately 300

Sustainability Coordinator meets regularly with Senior Leadership team to provide sustainability updates

Sustainability Manager position increased to full time status in 2010. This person reports directly to hospital Senior Leadership

Consulted with the office supply vendor to evaluate supply changes that would be more environmentally friendly. We were doing half of the items on their checklist already and have worked with purchasing to initiate other recommendations

Promoted "Catalog Choice" for eliminating junk mail

The University is a Charter Signatory and Leadership Circle Member of the American College & University Presidents' Climate Commitment

Two sustainability leaders completed post graduate diplomas in Sustainability from local university.

University Campus OR green team participated in a study on reusable versus disposable isolation gowns, in partnership with MnTAP. A Life Cycle Analysis was performed and reusable gowns were found to be environmentally superior

Reduced the amount of printing and paper consumption. Our compliance handbook is now available electronically and rather than a card that is signed, employees acknowledge and electronically sign off. Savings include \$4 per handbook and a decrease in waste

We had a vegetable swap this past summer where employees could bring in excess vegetables and swap for other items wanted

Have staff take care of many flower beds leading to our buildings for cost savings and comfort

Promoted participation in a Carbon Fast for Lent; weekly green tips sent out to staff

II. A CULTURE OF SUSTAINABILITY

Supplement to Table 5: Leadership within the Local Community

Attend monthly City "Green Team" breakfasts to meet local businesses and community groups. We share ideas and tour local facilities to see what they are doing locally, nationally or internationally to be environmentally conscious or to sustain their programs

College Internship Program: We partnered with the local college's Sustainable Business Program to provide paid internship programs. Sustainability Interns are working on programs including waste reduction/recycling, sustainability education, website development, energy management, sustainable food systems and design and construction

Board Leadership for Cooperative Development Fund

Represented Environmental Leadership at the 2010 system-wide Health Convocation

Was the original site for medical waste incineration stack testing for the EPA and the Michigan DNR

Provide Cell Phones for Soldiers drop off site; Collected used cell phones for YWCA during earth day event

Child Care Center participated in system-wide green gift wrap events by decorating the backs of old engineering prints to turn them into wrapping paper

Performed clean-up along local roads

CEO was interviewed about our environmental initiatives by a local newspaper

Collaborated with City on sustainability initiatives

Collected household batteries during Earth Day event

Collected materials from around the hospital (boxes from warehouse, blue wrap, old engineering prints decorated by our Childcare Centers) for employees and hospital visitors to reuse to wrap gifts in place of traditional wrapping materials

Host community Farmers Market

Presented a regional webinar with other partners that included sections of community gardening education and resources in creating a greener footprint. Local groups participate in our community garden, in composting and in other educational opportunities provided by our Health System.

Concurrent session presentation at American Holistic Nurses Association annual convention re: Going Green; also presented poster at local conference on Go Green initiatives.

Created a series of "Going Green" videos shot at various locations around our facilities and related to each month's 'Green Standard' sustainability theme

Director of Engineering is on the town's recycling board

Discussed Green procurement practices with the Medical Staff

Our EVS Director and Sustainability Lead spoke on environmental sustainability in Health Care at a dozen events

Educated our patients to Healthier Hospital Greening efforts

Embedded Green program updates in standard hospital meetings

Teamed up with local elementary school for Earth Day. The school brought everyone into the gym and two sets of students performed a skit on recycling, reusing, and reducing which lead into my presentation on Sustainability in the community

Green Team presentation to our Director's Council

Supplement to Table 5: Leadership within the Local Community

Green Team staffed booths for two summer community events in which our hospital participated, including an art festival and an "Evening in the Park" concert at our central local park
Held small farmers markets for visitors, educated community about sustainability and environmental health at our green fair held in the fall
Our EVS Director was invited to spend a week with another health system in Pennsylvania. Presentations were given at three hospitals; ideas were shared on how they could start down a more formal environmental path
Interviewed by local newspaper and magazine, and had several articles published about our initiatives
Local elementary school made garden plaques using plastic trays from surgery for our native garden
Management Foundations Training presentations
Member of San Diego "Zero-Waste"
Received local Metropolitan Sewage District Grant Recipient of \$360,000 for Sustainable Green Roof
New partnership with the Water Street Coffee Joint in opening a coffee shop in our atrium. This coffee shop is widely known and respected for its commitment to local foods, fair trade certification and reuse/recycling efforts
Held Nike Reuse a Shoe collection during Earth Day event
Numerous health fairs, including children's health fair at the community campus
Offered healthy food and fitness classes to community members
Offered community sharps collections on regular basis
Our in-house Green Team Video received a Telly Award
An overview of our sustainability program and our commitment to the environment is included in our hospital Visitor and Patient Guide
Participated in Green Venues EPA Program as an Affiliate Member
Participated in the city's Hospital Safety Professionals meeting bi-monthly
Participated in local meetings regarding homeless veterans
Passed out CFLs to staff and visitors at Earth Day celebration
Past winner of EPA Brownfield Program Award for Community Impact: Construction of an environmentally progressive health care laundry facility in collaboration with the City and the Neighborhood Association brought 100 jobs to a blighted urban area. Many of our employees can walk to work, versus a 30 mile commute at the original laundry location
Presented sustainability at local public schools
Presented to hospital advisory board which consists of community leaders
Presented to local interfaith clergy association and continue to share our results and programs with this group
Promoted green initiatives at local community holiday eventsMemorial Day parade and 4th of July celebrations
Provided a Community Sharps Disposal Program
Provided free blood pressure and body composition screenings for community
Provided recycling locations for employees to drop off electronics and batteries
Received recognition from Union Sanitary District for our Community Medication Take-back Program and a 2010 StopWaste Business Efficiency Award for outstanding achievement in waste reduction and environmental performance

Supplement to Table 5: Leadership within the Local Community

Recognized by the local Area Chamber of Commerce as a Green Sustainable Business

Recognized by Xcel Energy for the hospitals efforts in improving environmental sustainability; Received the "Passing the Baton" sustainability award from the local University Student Senate for "passing on a better community" and being a community leader in sustainability and leading the local food effort

Regular Twitter feed postings/Facebook, external newsletter promotion of sustainability topics and programming

Hosted Senior Walking Program

Shared Ecology Programs and Reports with hospital Community Board of Directors ' as well as hospital Board of Directors

Sharps Disposal Program and Issuance of Empty Reusable Sharps Container to Community

Signatory on Southwest Michigan Covenant

Participated on over half a dozen local and state committees and councils

Our Regional Hospital Network is comprised of 22 West Michigan Hospitals who's mission is to "Improve the health status of our communities," with 11 councils within the network including the Sustainability Committee, which our Sustainability Coordinator chairs. The business case for environmental sustainability was presented to all 22 network hospital CEO's. The presentation was very effective and since the presentation 17 of the hospital's CEO's have signed an environmental commitment statement. Our Sustainability Coordinator and the Operations Manager for the Network have conducted presentations to all hospital's Senior Leadership/Green Teams discussing the business case for environmental sustainability, getting started and next steps. These hospitals are completing the Practice Greenhealth Eco-checklist and developing action plans

Spoke on sustainability at county board/village town hall events

Our education department offers a free class for families on a quarterly basis, "It IS Easy Being Green". This class teaches families about environmental health hazards and how to reduce exposures through simple lifestyle changes. It also encourages families to advocate for themselves and their children by following chemical policy and contacting representatives

Sponsored local sustainability events and groups Key participation in local groups, including a seat on the Mayor's Sustainability Council

Sustainability presentations at six local universities

Taught classes in Healthy Eating for Children and their parents; conducted a Kids Camp providing exercise and healthy eating education

Worked with a local nonprofit, membership-based organization that promotes sensible growth and protecting special places; we have developed a community partnership which has focus and support in the areas of disease management as it relates to the environment and sustainable communities

Vice President of Southwest Michigan Sustainable Business Forum; met with other presidents and vice president to build state coalition

Volunteer at "San Diego Bright Green Future" Conference

Volunteer at Beach clean ups

Waiting message for patients includes details of the sustainability program and the Leadership Circle Award

Have a free-cycle office supply swap each quarter

Have set up our first community leadership greening and sustainability summit set for Feb 2011

Worked with local MRF to develop confidential document destruction program and even financed shredder for MRF

Supplement to Table 6: Leadership in the Health Care Sector

Active participants in Northern California Sustainable Healthcare Group

Advised vendors relative to our Environmentally Preferred Purchasing Policy

AHE 2010 award for safety and quality improvement in Environmental Services

Assisted in preparing a conference for the health care community on the Central Coast in California

Attended EPA Region 1 Green Chemistry Networking Forum

Awarded Wisconsin Buy Local grant to launch local food project by Governor

Belong to local Green Team's Business Round Table

Charter member of the Built Environment Network (a new program of the Center for Health Care Design)

Charter signatory of the Southwest Michigan Sustainability Covenant

Collaborated with local College on a Green Design conference and full weekend event

Collaborative work with local colleges to establish a viable kitchen waste composting program

COO presented at CleanMed. CEO signed HHI Pledge

Created video highlighting our sustainable initiatives which has been widely shown at annual leadership conference, new employee orientation, and other system Hospitals around the country

Featured in USDA national conference in Washington, DC as keynote presenter on local food project

Foundation Board implemented plan to make annual Gala green, using an electronic auction program rather than printing, using recycled paper for invitations and reducing the decorations to reduce waste

Have done a lot towards "Greening the OR" specifically, and worked Dr. Andrade and Practice Greenhealth to spread the word

Hosted a multitude of sustainability tours and lectures through Main Campus for local community members and health care professionals

Hosted a workshop for other hospitals throughout the country that are working toward Baldrige Quality Program, including presentation on environmental sustainability and sustainable food

Hosted PGH Sustainability Training and sent 8 employees. Presented at CleanMed. Developed case study on our medication take back event for PGH

National pilot site for clinical plastics recycling

Published article in the New England Healthcare Engineering Society (NEHES) on our sustainability programs

Our EVS Director was asked by a construction company to spend a day with Langlade hospital in Antigo,WI, to provide input on construction aspects that would aid in long term sustainability efforts. Langlade is currently breaking ground on a new facility

Our Sustainability Coordinator is currently a part of the Novation Environmental Advisory Group

Our Sustainability Coordinator is the current chair of the Michigan Green HealthCare Committee and we hosted the 2010 Michigan Green HealthCare Conference

Our Sustainability Program presented at eight state-wide and national events outside the hospital this year

Our Sustainability Program was featured in 7 local, state and national publications

Participate with other local Federal Facilities in "Sustainable Practices" meetings

Participated in EPEAT Standards setting committee

Participated on Sustainability Panel at Silicon Valley ASQ Conference 2010

Supplement to Table 6: Leadership in the Health Care Sector

Presented at a national Peace Presentation put on by the Methodist Church

Presented at a National Workshop for OR directors put on by SG2

Presented at AORN Congress

Presented at two international conferences: Footprint Forum in Italy and European Medical Waste Congress in Amsterdam

Presented at Wisconsin Department of Natural Resources by invitation of RMW agency office

Provided assistance to PGH in reviewing award submissions

Provided Home-Generated Sharps Disposal Kiosk

Received the 2010 Vermont Governor's award

Received USDA grant

Received the Mayor's beautification award for 2010 for both internal and external design, for our Cancer Center build. The awards were won in large part, due to the environmental aspects of the building as well as the green roof

Spoke at a hospital outside of our system on sustainability and our recycling efforts and spoke to their Green Team on various successes

Submitted USDA grant proposal to support local food effort

The hospital started to receive calls from next of kin wishing to return wheelchairs, walkers, and other equipment after the death of a family member. To encourage this recycling effort in the community, we developed a program through our foundation that accepts these items, has them cleaned and refurbished if necessary. They are then made available to the public (charity care) through our DME

Created sustainability video that has been shared with all hospitals within our health system and was shown at our annual system-wide leadership conference

We will be the first hospital in our system to have a community greening and sustainability summit in 2011

Worked with County Greening Committee relative to food composing

Working with local university on Sustainability lunch and learn for small businesses in local area for physician practices

XI. FACILITIES AND CONSTRUCTION

Supplement to Table 48: Energy Efficiency Projects

12 Variable Frequency Drives added to main air handling units allowing us to ramp down the fans during low use times
Chiller Optimization; replaced chiller; chiller upgrades
Added motion sensors to low occupancy rooms
Capital Repairs to BAS Controls (IBMS); Boiler damper and coil; Newly installed chillers
Energy Efficiency projects for lighting, cooling, steam piping and chilled water
Replaced half of our existing servers with virtualized servers
Parking structure re-lamp with LED
Green data center
Thermal Energy Storage
Strategic Energy plan third year projects
Chiller water recommissioning
Variable pumping for potable water; Lighting and controls upgrades in various location
Installed missing insulation at hospital
Heat Wheel replacement
Moved majority of servers to a server farm that was built for this purpose and all servers are energy efficient
Replaced failed insulation on high temp steam lines
Installed high-efficiency hand dryers; Installed insulation on steam boilers, reducing overall gas usage and heat loss
Computer upgrade and energy consumption reduction program
Low Pressure Boiler Controls; Co-generation plant
Side Stream Filters on Cooling Tower/Condenser Supply Piping; Boiler Stack Heat Recovery
AHU Controls Upgrades
New windows in older building
Steam Trap Survey
Bern Retro Commissioning
Dual fuel central power plant
Cooling Tower VFD upgrade; Chilled water retrofit to variable primary pumping
Retro commissioning- replaced controllers of motors that heat and cool the building
Phased replacement of exterior windows
Parallel Controls On Boilers
Motion detectors
Sleep Mode for Computer Monitors

Supplement to Table 48: Energy Efficiency Projects

GOR: 6th floor surgery lights, 600 bulbs changed from 35 watt to 27 watt

Lighting Retrofits; Campus-wide lighting retrofit t-12 to t-8; LED lights; relamp existing fixtures with more efficient bulbs that provide the same quality and quantity (lumens) output; T-8 re-lamping/electronic ballast project; replamp parking structure

Tower Motion and timer installations

Replaced roof

Replacement of existing Control Systems to Johnson Control controllers

Medical Air Vacuum System

Repositioned daylight sensors and rewired circuitry to improve energy efficiency of parking garage

Installed Solar Arrays

Replaced two air-handlers with new VFD controls

Co-generation plant

Installed building management system (BMS) that schedules air handlers based on building occupancy and demand-based operation

Construction of new Central Plant; building lighting retrofit

Savings by Design Project in Planning Stage- Audited completed by PG&E to identify potential savings for gas and electric use

The primary focus here has been on rebuilding our cooling towers with Green Machines. This eliminates the amount of chemicals use. We replaced one tower in 2010 and will replace the second in 2011

Supplement to Table 49: Commissioning

A recommissioning of our OR was done during our renovation this past spring	
We use in-house staff to perform routine Preventative Maintenance (PM) to HVAC equipment w not limited to, replacing filters, checking for leaks and tears, and emptying drip pans	hich includes, but is
Actively look for deficiencies with commissioning during Environmental of Care Tours conducted conduct monthly building maintenance tours	d bimonthly. Also
Optimize Air flow changes/hour, air pressure balance requirements	
All construction projects are commissioned	
All new building and major renovation will be commissioned. Internal engineers oversee the pro-	ocess
All refrigerators and freezers are on preventive maintenance schedules to clean condensers and operating at peak efficiency	make sure they are
Annual commissioning done on VAV valve boxes on the HVAC systems	
For any new or renovated area, we have an outside consultant provide commissioning We are currently replacing two air handlers that are over 40 years old and have had two consulta energy usage assessments	ant firms provide
Conducted building wide energy audit in 2010 in conjunction/partnership with local school district	t and municipal offices
Conducted retrocommissioning on 37 air handling units. Upgraded from pneumatic to direct di 300,000 sq. feet of conditioned space in 2010	gital controls in
During new construction a third party consultant conducts commissioning activities	
Establish and monitor baselines in accordance with IPMVP	
Have replaced 18 out of 21 air handling units with new, energy efficient units. Also, put mixing b avoid cooling coils in patient rooms (reduced leaks)	poxes in corridors to
Have used commissioning on several expansion projects.	
Perform Infrared monitoring every three years to check primary switch gear	
Commissioning is part of our normal PM, not a formal consultant based "recommissioning"	
Performed retro-commissioning on three HVAC fan systems and chilled water loop	
Purchased infrared guns to conduct annual inspections	
All newly constructed medical and dental facilities go through a Total Building Commissioning p mechanical and electrical systems	process for all
Set our building automation system to color coded graphics for temperature control in each pat added chiller automation controls this year	tient room. Also
The commissioning program required an engineering assessment and is currently underway. Th investment for this project but we anticipate that it will be very beneficial for our energy efficient	
The Medical Center works closely with the Capital Project group and hired an independent third commissioning agent	l party as a
We trend our discharge air temperatures; Trend equipment start/stops for maximizing efficiency drives on HVAC; Perform regular Boiler efficiency testing	r; Variable frequency
Updated operating procedures and control sequence of HVAC equipment to optimize operating heat wheels (2 units); both units were 100% outside air machines equipped with non functionin systems in the exhaust stream	

Supplement to Table 49: Commissioning

Using a strong and trackable Preventative maintenance program, we are able to follow patterns of filter use as well as pinpoint possible issues before they arise

We have retro-commissioned all of our major systems, surgery, ER, Cathlab, Radiology, and our chiller plant. We have devised a plan to implement our ECM's that resulted from this process

We just embarked on vibration analysis to make sure that pumps and motors are aligned properly. This extends both life and efficiency of equipment

Supplement to Table 52 and Table 53: Potable Water Use Reduction

While we have not completed any large water conservation projects, our total water savings through <u>small ongoing</u>. <u>initiatives</u> is 38 million gallons annually

Increased availability and use of waterless hand de-germers (sanitizers)

Convinced kitchen to stop defrosting meat with running tap water

Efforts in past year helped reduce potable water consumption dramatically. Water costs for 2009 were \$706K and dropped to \$622K in 2010

Eliminated water Venturi vacuum systems on sterilizers, put water cooled refrigeration systems on closed loop cooling system

Implemented the high efficiency irrigation technology in 2009, and are maintaining it

Installed a native plant garden, seeking a grant for a rain garden. Our holding pond is used for lawn irrigation

Just started using Energy Star's Water program because hospitals are not allowed to be members of the EPAs Water Sense program. Have started installing sensor water faucets in public restrooms. Projects saved over 8 million gallons annually

New dishwasher in kitchen saved 600,000 gallons per year

Our 22,000 square foot "Living Roof" includes drains that carry excess rain water to 4,000 gallon underground cisterns. The captured rain water is used to irrigate ground level gardens.

Installed a Storm Water Management System on our campus that takes all run off and sends it through a underground filtration system that creates a 99% pure water stream prior to being sent down the storm drains

Our landscaping plan is based on xeriscaping principles; we only have water efficient, native and adapted, non-invasive climate tolerant plantings. We do not have an irrigation system and we do not water

Our new water softener will reduce the hardness of our water and the scale in equipment. It will also reduce our cooling tower blow down and our boiler blow down

Provided separate water meters at the facility to monitor consumption

Recent landscaping renovation included the increase of native plants and natural areas and the decrease of grass areas that needed water and chemicals. More mulch being used to control weeds and maintain soil

New irrigation system was installed to reduce overall water usage. Irrigation system can be controlled better than the old system. We water only during early morning hours and never during rain

Reclaimed an area used for construction staging. 2.5 acres were planted with native prairie grasses and wildflowers and needs no irrigation

Reduced irrigation times throughout the facility; this is helping to cut costs and reduce use of water. Using timers on all stations around the facility allows exact usage and easier metering

Supplement to Table 52 and Table 53: Potable Water Use Reduction

Use gray water irrigation system. In addition, approximately 80% of our landscaped area is planted with native species that do not require irrigation. We are a zero discharge site (we keep and treat all storm water onsite). We have a system of bioretention and grassy swales throughout our employee and patient parking lots. We purchased a commercial grade washing machine that is water efficient

Surgery Center constructed to distribute rain water to green spaces around the surgical center

The Medical Center front entrance landscape design project involved landscape re-design using ornamental grasses and native species. Irrigation equipment was installed (pop-up watering heads and drip irrigation) and at a future date will be linked into the campus-wide control system

Introduced a low water use landscape design; Improved the efficiency of the irrigation system. Scheduled irrigation during early and late hours. Maintained existing partnership between design and maintenance personnel as it relates to plant material selection, efficient usage of water and labor

Used gator bags for drip irrigation

Utilized the data from power provider to better track water consumption and identify opportunities to reduce. We also have moisture and freeze sensors for our irrigation system to monitor water consumption. Water usage varies tremendously based on high temperatures especially during summer months

Track water usage and that of the contractors for our new builiding to see if we do get peaks and valleys in our usage throughout the project. If we can pinpoint problem areas we will get our team together to find out if we can right the usage problem to bring it on line to save money

We calculate our fixture potable water use per occupant and per square foot every three years

When designing and building new spaces, we install water conserving plumbing fixtures