

Energy Efficiency Opportunities for Hospitals in the United States

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Report Summary: There are nearly 6,000 hospitals in the United States and the annual energy cost is over \$8.8 billion. That's the combined cost to run the heating and air conditioning, labs and data centers, lighting and water heating, patient rooms, operating theaters, laundry, food service and much more. Hospital spending nationwide is topping \$700 billion annually or 5% of GDP and over 12% goes for power. That means the average hospital pays nearly \$1.5 million in electricity costs per year or over \$25 per bed per day. And the cost is rising at rate of 15% a year or more given greater demand for electricity and lack of increased supply as we build and commission fewer power plants and power generating sources in the country. For CEOs, CFOs and management teams at early adopter and innovative hospitals a solution is available and it is reaping sizeable returns on investment (ROI) and internal rates of return (IRR) with nominal risk. These innovative and forward looking executives are adopting energy efficiency practices, incorporating Department of Energy guidelines and energy industry metrics and hiring energy efficiency engineering firms to help them drive costs out of the P&L. Implementing a holistic energy management plan across the hospital enterprise can result in savings of 20% or more in electricity use, recurring savings to the P&L and potential for energy incentives or rebates from utility companies, today.

Hospital Energy Efficiency Report:

Hospital CEO's and financial teams in the United States are focused on two major challenges today: healthcare reform implications and managing costs and cash

flow that allow the facility to survive and meet growing healthcare needs. A hospital's core competence and community value is centered on top level patient care and service. Yet, spiraling fixed costs and increased volatility levels of variables on the P&L are making chief executives and their CFOs increasingly focused on cost management.

Financial challenges ranked No. 1 on the list of hospital CEOs' top concerns in 2009, making it their No. 1 issue for the last five years, according to the American College of Healthcare Executives' (ACHE) annual survey of top issues confronting hospital CEOs. Top CEO issues are noted below.

Issue	2009	2008	2007
Financial challenges	76%	77%	70%
Healthcare reform implications	53%	NA	NA
Care for the uninsured	37%	41%	38%
Patient safety and quality 1	32%	43%	NA
Governmental mandates	30%	26%	22%
Physician-hospital relations	25%	32%	35%
Patient satisfaction	15%	22%	17%
Personnel shortages	13%	30%	30%
Capacity	7%	16%	11%
Technology	7%	9%	8%
Governance	2%	NA	NA
Disaster preparedness2	1%	1%	1%
Issues about not-for-profit status	1%	2%	4%
Patient safety	NA	NA	29%
Quality	NA	NA	33%
Issue	2009	2008	2007

Hospitals in America spent nearly 60% of their costs on wages and benefits; 14% for food, medical instruments and other products; 6% for prescription drugs and another 20% for other services including general engineering, maintenance, utilities and professional fees. The hospital supply chain is large, complicated, inefficient and costly. Most hospitals are now employing financial analysts and outside supply chain specialists to identify waste and abuse and drive out costs.

It's no surprise to learn electricity costs are averaging \$25 per bed per day in America. The 6,000 hospitals in America spend \$8.8 billion in electricity costs per year or about \$1.5 million each. And the cost is rising at rate of 15% to 20% per year and in some regions of the country over 25% or more. Hospitals consume 2.5 times the energy of an office building or factory. In a recent survey by Health

Facility Management magazine 90 percent of the responding hospitals reported that their energy bills increased over the previous year. For 15 percent of the respondents, that increase was 25 percent or higher. As budgetary pressures mount, hospital administrators are discovering that energy efficiency offers a cost savings opportunity they cannot ignore

The plug load or energy draw from a vast range of energy hungry machines and systems including MRI machines, lighting, HVAC, chillers, ventilation systems and data centers is being increased nationwide while electricity generation remains flat given the dearth of new power plants. This supply and demand issue has prompted state and federal government agencies to develop and campaign for green energy and other solutions and in parallel the private sector is moving to drive out costs by managing energy use more efficiently.

Processes, Metrics and Guidelines in Place

The Department of Energy, Energy Star and Hospital Energy Alliance have developed numerous processes, guidelines, software tools and metrics for energy benchmarks and programs while industry agencies such as the U.S. Green Building Council with its LEED program, the Green Guide for Healthcare (GGHC), and ASHE have followed suit and in some cases provided thorough models and programs and provided reference cases and best practices.

The Department of Energy reports facilities that have implemented energy efficient procedures in America use 35% less energy, on average, than their competitors. DoE's Energy Smart Hospitals program claims "Every dollar a non-profit hospital saves on energy is equivalent to generating new revenues of \$20 or \$10 for medical offices." It suggests the money invested in energy efficiency and the savings that result would wash through the P&L to the bottom line. An energy efficiency investment should be accretive to the hospital.

No one size fits all solution

Yet there is not a one size fits all or simple answer to taking the journey or arriving at the destination. But it can be reached. Every hospital is different with the business model for one--including use of CapEx and OpEx funds, local tax laws,

and internal use of working capital, utility rebate processes and GAAP treatments-
-proving very different from another.

There is no cookie cutter approach to energy efficiency and cost savings. However, there are energy efficiency options for a hospital to pursue which can generate a high level of confidence that the business model, financial needs and on-going operations including patient care can be achieved with modest risk and potentially significant financial and community gain.

SMG Energy Group believes a holistic approach that uses proper technical measurements and benchmarks, energy efficiency rated products and equipment, and implements a closed loop process and develops a corporate culture around energy conservation can succeed.

Hospitals embracing such an approach can achieve 25% cuts in energy use that turn into recurring savings with payback in 4 to 8 months and an IRR of over 300%. A 25% cost reduction would return on average \$360,000 to every hospital in the U.S. That reduces the cost per bed day rate from \$25.35 to \$19.01 or savings of \$6.34 per day on a recurring basis with a properly implemented energy management program.

“Every dollar a nonprofit hospital saves on energy is equivalent to generating new revenues of \$20...”

Office of Energy Efficiency and Renewable Energy (EERE), U.S. Department of Energy

Some market dynamics impacting decisions to introduce and implement an energy management plan at a hospital:

- Why: non-existent or limited energy or engineering core competence in the hospital; political and economic pain to reduce operational costs; community prestige for high AHA rating

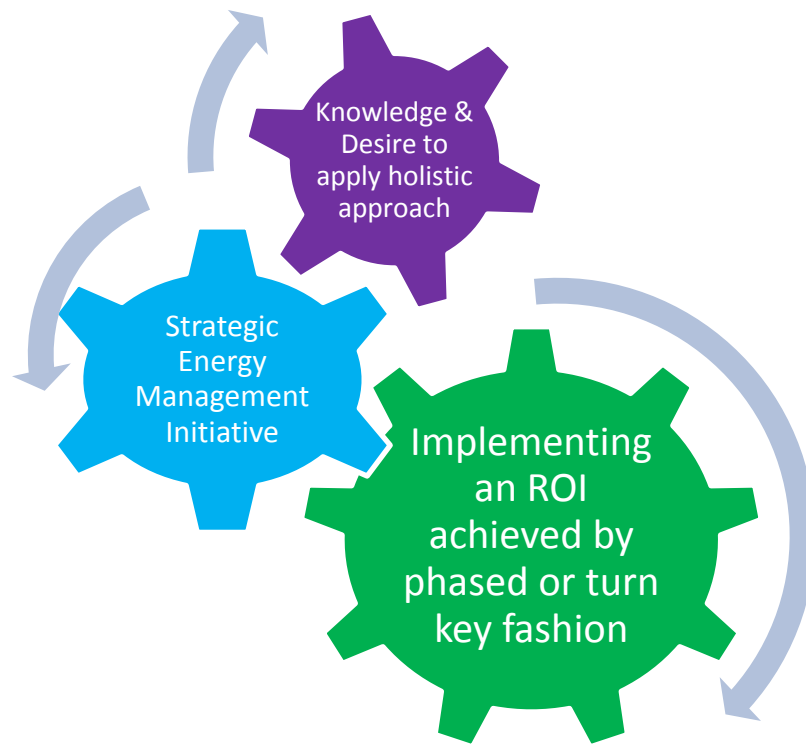
- What: Energy costs growing at rate of 25% annually; backlog growing in repairs and renovation & new construction; tools, technologies and metrics exist to improve hospital efficiency
- How: Energy management plans, ROI models, grants/incentives; 4 to 8 month pay back typical to maximum 4 year payback
- What if: Hospitals could reduce their energy costs by 20% within 4 months?

No matter what the goal the step process needs to be a top down effort. Reaching energy efficiency and developing and implementing an energy management plan at your hospital should be a *CEO initiative*. The CEO and by extension the CFO must be the owners and 'super program managers' for the program to succeed.

Financial Focus

It is primarily a financial effort but to succeed all departments must be touched and an energy conscious culture developed. The energy initiative should involve the core management team including facilities, the CIO and other department heads and involve an outside energy management company as a partner. This firm should have the requisite energy certifications and energy management technical skills but also possess strong business knowledge and financial skills.

In developing the plan it will most likely not be about finding more operating or capital dollars. Rather, it will involve reallocating operating budgets already approved to gain maximize value for the hospital. There are opportunities to cut energy use by as much as one-half within certain portions of the facility such as lighting, data centers, HVACs, food service, laundry, and all other departments and areas. No area is off limits to energy management review and efficiency gains.



Steps in the Process

Some key top level steps to energy management process flow and success are:

Phase 1.

1. Make a Commitment
 - a. Establish top level enterprise plan for success
 - b. Develop an energy management board/team
 - c. Create a CEO initiative
 - d. Hire external energy engineering firm to conduct an energy benchmark and assist the team in the energy management process. Beware of suppliers and vendor's offering no cost benchmarks as they may be biased desiring to sell products and services. Conversely, an energy engineering firm should be unbiased and provide expert qualified measurements and metrics while serving as an extension of the hospital and cost management team. They can provide engineering measurements, metrics and monitoring based on best practices and energy engineer qualifications and offer options and solutions. Moreover, if desired, they can recommend

third party vendors and service firms to support the retrofit or recommissioning work.

2. Assess Performance & Set Goals

- a. Rate existing buildings and facilities from 1 to 100 relative to similar buildings nationwide using Energy Star Portfolio Manager and other tools and calculators
- b. Set a target of minimum 20% and average 25% energy savings for the hospital
- c. Calculate the first pass financial impact and ROI for improved energy performance
- d. Consider turn key

Hire external energy engineering firm to conduct an energy benchmark and assist the team in the energy management process.

Phase 2.

3. Create an Action Plan

- a. Develop a strategic energy management plan (SEMP for the hospital). It should include the entire facility including core buildings and the data center
- b. Goals and objectives
- c. Key milestones & Schedules
- d. Reporting process and feedback

4. Implement the Action Plan

- a. Engage in phased or modular fashion using savings to fund next step
 - i. Phased Implementation Approach Mitigates Risk:
 1. Non-traditional investment
 2. Diagnostic phase requires up front cost and sustained effort (ranging from \$40K to \$100K+ for large hospitals)
 3. Scope of work
 4. Initial diagnostic and investigation work
 5. Set aside percentage of hospital O&M and invest in facility energy savings

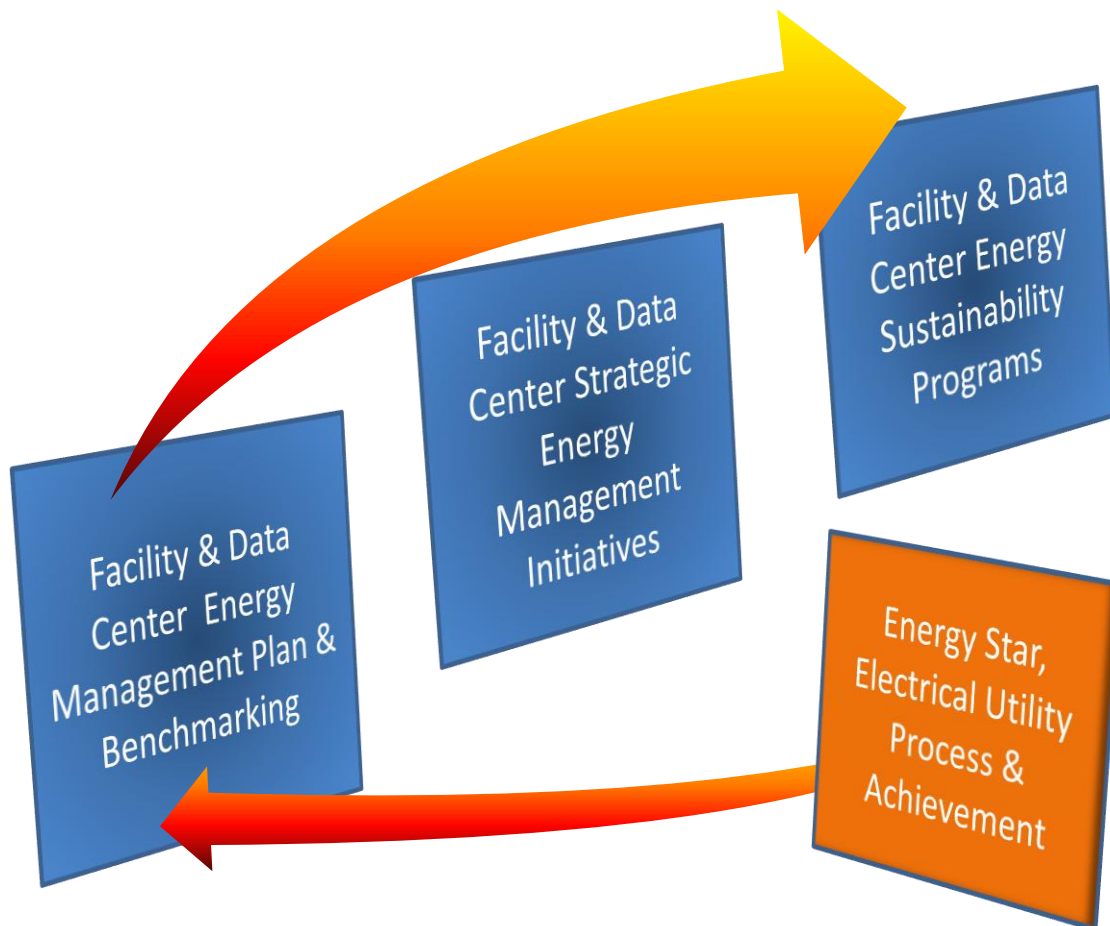
6. Utility bill savings create new “revenue streams” that are used to fund more savings
 7. As each cost saving measure is completed the revenue stream from utility savings becomes larger—allows for diverting some of that savings to new reinvestment and upgrades
- b. Engage in a turn-key energy management program
- i. Comprehensive energy management plan that follows retrofit or planned upgrade to the hospital facilities
 1. Turn-key program
 2. Traditional model with redirect of operational budget
 3. Diagnostic phase requires up front cost and sustained effort (ranging from \$40K to \$100K+ for large hospitals)
 4. Scope of work
 5. Initial diagnostic and investigation work
 6. Calculate the ROI model and payback
 7. Focus on high ROI areas first
5. Evaluate Progress—(reassess as required and reset expectations, schedules etc. accordingly)



Hospitals energy management plans must be CEO initiatives supporting a plan for success. Focus on occupancy patterns. Know how systems are zoned and scheduled and if they are operating consistently when people are in the facility – this is true for both HVAC and lighting

Phase 3.

6. Document progress against benchmark and utility plan
7. Secure incentives & rebates
 - a. Insure the utility rebate program is created early on and documented with the electricity company
8. Recognize and Share Achievements
 - a. Hospitals ranking 75 points or higher may display the Energy Star logo
 - b. Hospitals can be ranked Energy Star leaders if they improve their initial ratings by 10, 20 or 30 points
9. Sustainability Plan implemented



Three Phase energy management plan leads to high ROI and mitigated risk.

Early Adopters Save \$200 Million by Summer 2012

Today only a small percentage of hospitals have implemented formal energy management plans. Our calculations suggest less than 20% have taken formal steps as noted above to design, implement and execute on a formalized energy efficiency plan. We estimate from Oct 2010 through summer 2012 approximately 500 hospitals will take action and employ energy savings plans.

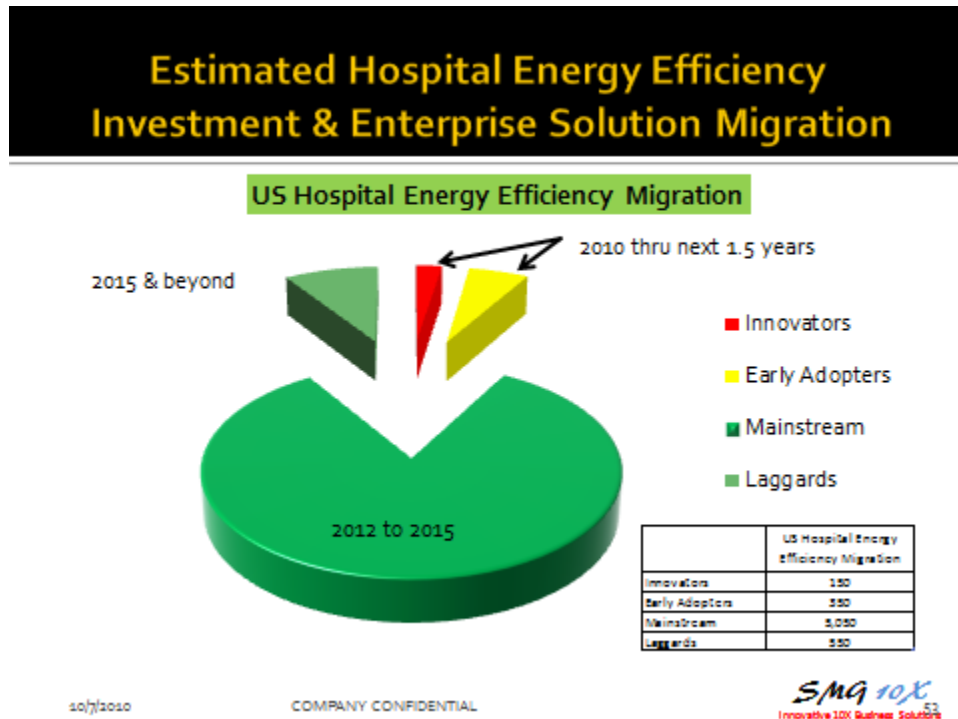
A 25% savings across those facilities will generate over \$200 million per year in annualized energy cost savings. In 10 years a single hospital could yield over \$3 million in cash savings with a high ROI and short IRR energy management plan.

Hospitals that have achieved energy savings using a comprehensive energy management plan and highlighted by industry group ASHE include: Shriners Hospitals for Children, Houston, TX (34%); Northwest Medical Center, Springdale, AK (13%); West Jefferson Medical Center, Marrero, LA (10%); St. Francis Hospital & Health Services, Maryville, MO (13%); Yuma Regional Medical Center, Yuma, AZ (17%); New York-Presbyterian Hospital, New York, NY (10%-40% in four medical facilities).

Characteristics of early adopter and innovative hospitals are:

- Primarily Medium to Large Hospitals and Med Centers
- Large acute care 'power user' ; 'enlightened,' innovative, established, environmentally sensitive, cost focused, ROI driven
- May be energy 'conscious' yet energy 'inefficient'
- Energy owner or experts unknown in the enterprise (fragmented)
- Economic pain. Board and Exec management directives to drive out hospital costs including energy costs based on clear return on investment models
- Political pain. Community, employee and industry sensitivity to notion better health management comes through better energy and environmental management of the medical center or hospital
 - Regional pain (be best for community)
 - Brand building pain (be best in region or specialties)
- Potential to gain incentive and rebate funds and grants from government and utilities

The 80% yet to participate are leaving money on the table. Over \$2 billion per year and each year thereafter. The chart below shows the expected adoption of energy efficiency by the U.S. hospital industry over the next five years.



- Sixty-seven percent of healthcare CEOs list financial challenges as their number one concern and 75% of senior decision-makers believe energy costs are the least controllable business cost. Meanwhile, U.S. hospitals are the second most energy-intensive commercial space type, making the impact of unstable energy prices and of savings from energy efficiency investments particularly significant.
- Hospitals nationwide have been able to demonstrate that energy investments can create healthier hospitals — both for the environment and the bottom line. Facility managers today can position energy as a controllable cost that, when well-managed, can produce significant energy savings. ENERGY STAR partners effectively make the business case for energy performance investments by positioning energy as an investment-grade opportunity, using online financial tools to support their planning,

and making an effective pitch that speaks in executive terms and aligns with the hospital's core mission.

Some of the top reasons hospital CEOs and financial chiefs are embracing energy costs savings are as noted above: it is no longer seen as a variable one that cannot be controlled.

"Green and evidence-based design is often stuff that falls into the 'wishes and wants' category, and that can be what gets cut," says Dale Woodin, CHFM, FASHE, the executive director of ASHE. **"Basic savings and energy efficiency, that's ingrained into planning now.** But rooftop gardens, waterless urinals, some of those things—there's a real discussion about whether they are essential needs."

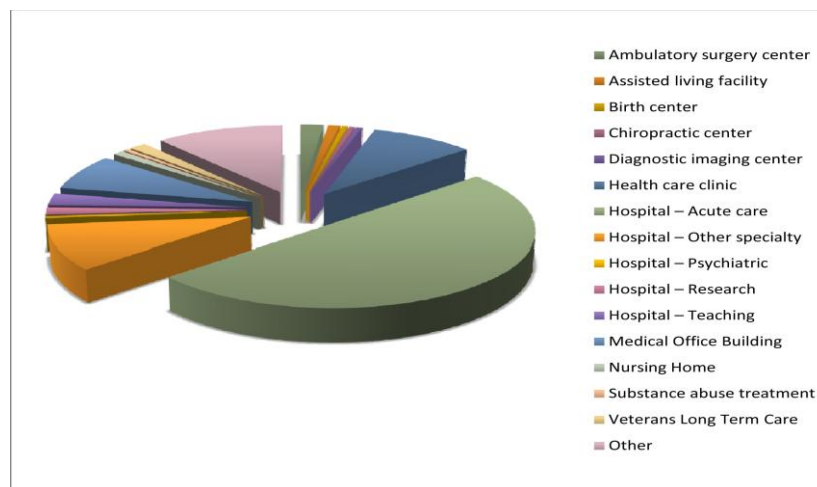
A 25% energy savings across the U.S. hospital market would yield over \$2.2 billion in energy costs savings year over year. Energy management initiatives create high wage management, technical and service jobs, improve the hospital working environment and allow the prime focus of the hospital team to be on patient care.

	Current Status	25% Energy Savings	Savings
Total annual energy costs	\$ 8,800,000,000.00	\$ 6,600,000,000.00	\$ 2,200,000,000.00
Avg annual energy cost per hospital	\$ 1,464,226.29	\$ 1,098,169.72	\$ 366,056.57
	Current Status	25% Energy Savings	Savings
Avg monthly cost per hospital	\$ 122,018.86	\$ 91,514.14	\$ 30,504.71
Avg daily cost per hospital	\$ 4,011.58	\$ 3,008.68	\$ 1,002.89
	Current Status	25% Energy Savings	Savings
Avg daily energy cost per bed	\$ 25.35	\$ 19.01	\$ 6.34

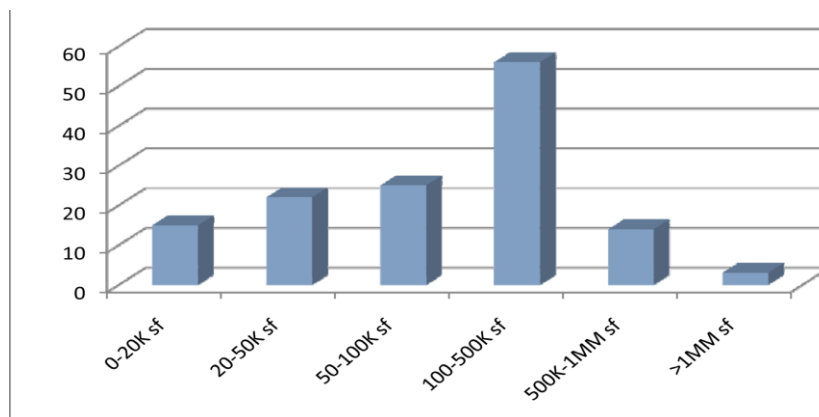
Source: SMG Energy Group and DoE

In concert with U.S. energy management plans are generalized green energy and green initiatives by hospitals. These vary in type and style and many have been postponed given they are more aesthetic or feel good in scope rather than providing economic pain solutions. As of June 2010, 196 projects are registered with the *Green Guide*, representing over 40 million square feet of construction. Consistent with earlier years, the majority of *Green Guide* registered projects are acute care hospitals, followed by specialty facilities and health care clinics.

Distribution by facility type and sq. footage is shown below.



Green Guide indicates 196 hospitals today have signed up for green initiatives programs.



Green Guide projects are underway across the size spectrum of hospitals with nearly 30% mid- to large size hospitals between 100,000 and 500,000 sq. ft.

For the next five to seven years or more hospitals are expected to focus on overall supply chain cost cutting measures and improvements to the balance sheet. Supply chain savings are being considered in every department from pharmacy to laundry to environmental services (EVS). This is will also include specific energy efficiency programs and management plans that have set targets and plans for success. The savings are tangible and achievable and finance officers and analysts see the opportunity for significant working capital gains.



Areas that present major opportunities for energy efficiency gains are high ventilation flow areas and High plug load departments. Big three for reduction is lighting, HVAC & data centers

Summary:

Energy efficiency of 25% or more can be obtained in hospitals today. In addition to its overall energy efficiency goals, an Energy Smart Hospital program at any hospital in the U.S. seeks to 1) increase efficient and renewable energy applications in hospitals 2) Reduce energy use and operating costs 3) Create healthier healing and work environments 4) Maximize successful hospital upgrades and design strategies 5) Ensure reliable backup power during disasters and 6) Improve environmental performance.

Innovative and proactive hospital executives are taking steps today to develop and implement energy plans. Reference accounts prove the savings are possible and sustainable. Driving costs out of the hospital is increasingly critical as energy costs increase and margins become tighter. A savings of over \$6.00 per day per bed via energy costs reduction pays a recurring \$360,000 per year for the average American hospital and over \$3 million in a 10 year cycle. For medium to large hospitals that number can be 3X to 5X in size or more. It is a prudent investment worth taking to achieve available savings today.

About SMG Energy Group: SMG ENERGY GROUP provides holistic energy management plans, energy efficiency consulting services, and sustainable energy solutions for hospitals, biotech facilities, laboratories, data centers and other high tech buildings and facilities. As energy experts SMG helps customers save 30% to 50% of energy use and costs using existing techniques, technologies and business practices. That energy use reduction becomes recurring cost savings. An investment in SMG energy efficiency services results in a payback many times over. www.smg10x.com and info@smg10x.com

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