

LED Lighting and HVAC Tax Aspects of Energy-Efficient Hospitals

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Rachelle Arum, Charlie Goulding and Andressa Bonafé discuss how tax deductions available under the Energy Policy Act of 2005 can be used as incentives for hospitals to upgrade their facilities to be more energy-efficient so that more resources can be allocated to improving the quality of care and reducing readmissions.

The U.S. Supreme Court, in *National Federation of Independent Business vs. Sebelius*,¹ affirmed the constitutionality of the Patient Protection and Affordable Care Act, commonly called Obamacare.² The Act's "Individual Mandate" requires Americans to have minimum health insurance. Under a portion of the act called the "value based purchasing program", hospitals will be remunerated on the basis of quality of care and a low readmission rate. Low wattage LED lighting and energy-efficient HVAC greatly reduces hospital operating and maintenance costs. This allows hospitals to devote more resources to improving their quality of care. Hospitals find that LED lighting has important advantages related to

specialized hospital function room areas including MRI scanning and infant care.

Tax Opportunities

Pursuant to Code Sec. 179D, as enacted by the Energy Policy Act of 2005 (EPAct),³ buildings making qualifying energy-reducing investments in their new or existing locations can obtain immediate tax deductions of up to \$1.80 per square foot.

If the building project does not qualify for the maximum \$1.80 per square foot immediate tax deduction, there are tax deductions of up to \$0.60 per square foot for each of the three major building subsystems: lighting, HVAC and the building envelope. The building envelope is every item on the building's exterior perimeter that touches the outside world including roof, walls, insulation, doors, windows and foundation. Designers of

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energy-efficient hospitals can earn tax incentives on government-owned hospital projects. Government-owned hospitals include state, county, city and Veterans Administration (VA) hospitals.

Energy Reduction: A Major Step Forward for Hospitals

As result of their 24/7 operations, hospitals use roughly two-and-a-half times the amount of energy as similar-sized commercial buildings. This helps explain why hospitals alone account for four percent of U.S. energy consumed. It is estimated that U.S. hospitals spend over \$6.5 billion annually on energy costs, equal to about 15 percent of hospital profits.

Compared to other buildings categories, hospitals have only recently addressed the need for major energy improvements. These initiatives have opened huge opportunities for the hospital sector. A recent study released at the CleanMed conference revealed that U.S. hospitals can achieve a 60-percent overall energy reduction.⁴ This translates into annual savings of over \$700,000 for a new hospital built to code. The “valued based purchasing” program will reduce the unnecessary readmissions, which is an estimated cost of \$17.5 billion annually. These large reductions in operating costs and improved efficiency allow hospitals to focus on what’s most important—patient care.

LED Lighting Shines Among Hospitals

Energy use constitutes one of the largest costs in hospitals, but it is also one of the most controllable costs. LED lighting is exceptionally efficient, which pays particular dividends in hospitals where lights operate day and night. LEDs boast life-spans exceeding twice the average span of a conventional bulb and require far less maintenance. As sticker prices continue to fall for LEDs, the cost-benefit analysis has shifted markedly in favor of LEDs.

In addition to their efficiency, LEDs are also noted for meaningful contributions to quality of care itself. Below are some such advantages:

- LED lighting is favorable for MRI diagnostic areas due to its light quality and its endurance within such an environment due to filaments unaffected by magnetic fields.
- LEDs conform to AIA Guidelines for Design and Construction of Hospital and Health Care Facilities by eliminating mercury.⁵

- LED lighting is being used as a healing agent to help ameliorate the side-effects of chemotherapy and improve infant skin diseases.
- CT and Ultrasound scan rooms have adapted dimmable LED bulbs and tubes for improved examination and patient comfort.
- The higher lumen output of LEDs helps reduce errors made by medical practitioners in examination and surgical rooms.

HVAC Strengthens Hospital’s Structure

Since hospitals are human-occupied, 24/7 facilities, HVAC is the largest building energy cost item. However, the role of HVAC in hospital care cannot be understated. Hospital HVAC systems are responsible for heating, cooling and ventilation, but also infection control, removal of harmful toxins and providing environments conducive for medical procedures and patient recovery. Energy-efficient ventilation allows hospitals to maintain low pressures for highly contaminated rooms to reduce the spread of infection and maintain high pressure in operating rooms to increase airflow. Hospital HVAC systems can also detect fires and eliminate smoke from exits and enclosures. Energy-efficient chillers and energy-efficient air changeover ventilation systems are often eligible for EPAct tax incentives.⁶

HVAC technology therefore presents a major opportunity to help hospitals both cut costs and improve quality of care. Specific HVAC controls include heat recovery (to recover 40 percent of all heat energy used), in-room environment tempering, vacancy air control, geothermal and thermal energy storage systems.

Geothermal Trends in Hospitals

Geothermal heat pumps provide large HVAC energy savings measures suitable for hospitals. Geothermal systems, which also carry a 10-percent tax credit on to themselves, can provide both heating and cooling. This technology can drastically reduce gas consumption and operating costs by 24 to 40 percent. Geothermal at the Muskogee Community Hospital in Oklahoma, for example, saved approximately \$50,000 in energy costs per year.⁷ The constant volume air handlers employed by geothermal technology also eliminate the need for large, noisy cooling towers, reducing water usage and chemical treatments.

Table 1. EAct Potential Government Building Designer Tax Benefits

Property	Total Square Footage	Lighting		HVAC Maximum Deduction	Building Envelope Maximum Deduction	Deduction Total
		Minimum Deduction	Maximum Deduction			
3801 Miranda Ave Palo Alto, CA	2,68,500	809,550	1,619,100	1,619,100	1,619,100	4,857,300
John D. Dingell Medical Center	2,227,700	668,310	1,336,620	1,336,620	1,336,620	4,009,860
Hunter Holmes McGuire Medical Center	2,056,000	616,800	1,233,600	1,233,600	1,233,600	3,700,800
Puget Sound Health Care System	1,714,260	514,278	1,028,556	1,028,556	1,028,556	3,085,668
3900 Woodland Avenue, Philadelphia, PA	1,591,659	477,498	954,995	954,995	954,995	2,864,986

*Total square footage is an estimation based on internet data indicating the average square feet of each location.

Hospital Leadership: Veterans Administration Joins the Hospital Energy Alliance

The Department of Energy's Hospital Energy Alliance has emphasized energy cost reduction in the hospital sector. As a Hospital Energy Alliance committee member, the VA complies with federal mandates by pursuing LEED certification. NORESKO, an energy services company and a leader in energy-efficient planning, partnered with the VA to implement large-scale facility upgrades in Los Angeles.⁸ Upgrades include direct digital HVAC controls, timers for air conditioning window units, more efficient ventilation, and retrofit lighting. Three Los Angeles VA Healthcare centers are estimated to have a first-year's savings of \$1 million and a total of \$24 million over the 19-year contract. Carbon emissions are expected to decrease by 4,000 metric tons. The VA has also invested in solar power, wind turbines and geothermal energy for medical centers.

Table 1 illustrates the potential EAct tax benefits related to a few of the nation's largest VA Hospitals.

Conclusion

Hospitals have realized cost savings and therapeutic qualities of LED lighting and HVAC technologies. Although some people feel that Obamacare may lead to a slowing of cost inflation, these investments improve hospital service quality. They ensure better

post-discharge by reducing Medicare reimbursements for hospitals with high readmissions rates. The major energy overhaul to hospitals reduces emissions and operating costs. In a financially strong industry segment, hospitals and healthcare organizations are moving quickly to an energy-efficient platform and undertaking these long waited improvements. EAct tax incentives will further accelerate this process.⁹

ENDNOTES

- ¹ *National Federation of Independent Business*, SCt, 2012-2 USTC ¶ 50,423, 132 SCt 2566.
- ² Patient Protection and Affordable Healthcare Act of 2010 (P.L. 111-148).
- ³ Energy Policy Act of 2005 (P.L. 109-58).
- ⁴ NBBJ, *Hospitals Can Reduce Energy Use by 60%*, SustainableBusiness.com. Available online at www.sustainablebusiness.com/index.cfm/go/news.viewpressrelease/id/168.
- ⁵ *The Best Lighting Choice for Hospitals*, My LED LIGHTING GUIDE, available online at www.myledlightingguide.com/Article.aspx?ArticleID=22.
- ⁶ Charles Goulding, Jacob Goldman and Joseph Most, *The Energy Tax Aspects of Chillers*, CORP. BUS. TAX'N MONTHLY, Oct. 2010, at 15.
- ⁷ Energy Star, *First Hospital Designed to Earn the ENERGY STAR: Muskogee Community Hospital*. Available online at www.energystar.gov.
- ⁸ PR Newswire, *NORESKO to Implement Energy Savings Performance Contract for U.S. Department of Veterans Affairs in Los Angeles*. Available online at www.prnewswire.com/news-releases/noresko-to-implement-energy-savings-performance-contract-for-us-department-of-veterans-affairs-in-los-angeles-163839666.html.
- ⁹ For additional information, see Charles Goulding, Joseph Most and Spencer Marr, *The Energy Tax Aspects of Geothermal Heat Pumps*, CORP. BUS. TAX'N MONTHLY, Dec. 2010, at 13; and A. Dhanya Thoppil, *New Light for Infant Jaundice*, WALL ST. J., Nov. 20, 2012, at B4.

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