

# Building Green Hospitals

*To build sustainable hospitals, set benchmarks and show financial benefits*

By MEDICA TOURISM STAFF WRITERS



**M**edica Tourism interviewed Alan Whitson who, after leaving the U.S. Navy's nuclear submarine program, began his career in corporate real estate and facility management in 1972.

Since then he's worked on over 25 million square feet of facilities around the world in various roles. Now, he consults, writes and speaks on the subject of high performance buildings and the workplace.

The author of many magazine articles and books, he is the lead presenter in the Corporate Realty, Design & Management Institute's popular seminar series, "Turning Green into Gold." He holds the professional designation of Real Property Administrator (RPA) from the Building Owners and Managers Institute and was one of the initial members of the organization that is now known as the International Facility Managers Association (IFMA).

Much of his recent work has focused on cost analysis and justification procedures for incorporating sustainability strategies into commercial and healthcare projects.

**MEDICA TOURISM:** With all the other priorities they face, why should health care executives (hospital CEOs) even pay attention to their energy use? And more broadly, to sustainability?

**ALAN WHITSON:** Almost a third of all hospitals lose money every year, and the easiest way to save money is to avoid or eliminate wasted energy use. To put that into perspective, for a typical hospital with a five percent net margin, reducing energy costs \$50,000 a year is equivalent to \$1,000,000 in gross revenue.

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As for the issue of sustainability, health care is the fourth largest source of mercury pollution in the United States. Just this year the EPA fined Memorial Sloan-Kettering \$214,240 for improper disposal practices. When properly applied, the concept of sustainability not only saves money but it protects the health of patients and health care workers.

**MEDICA TOURISM:** Are the potential energy savings in hospitals as great as what we see in other commercial buildings? What kind of savings can we expect in a typical hospital? What kind of return can they earn?

**ALAN WHITSON:** As of today the potential for energy savings is greater in hospitals than almost any other building type. Hospitals account for four percent of the nation's building square footage yet consume eight percent of the nation's energy. Only a fast food restaurant uses more energy per square foot than a hospital.

Did you know that 75 percent of the lights in a hospital are on 100 percent of the time? In many hospitals the only way to turn off a light fixture is at the breaker panel and to do so you turn off half the lights on a floor!



As for return on investment, it falls into a range depending upon each facility and type of project. I've seen returns that far exceed 100 percent, all the way down to the 15 to 20 percent range. Even at the low end of the range, that's a return 300 to 400 percent more than 10-year treasury bills! How many hospital CFO's are getting that type of return on their investments?

**MEDICA TOURISM:** If a hospital is building a new facility (or expanding an existing one) what can/should be done?

**ALAN WHITSON:** The most useful piece of advice I can give is to spend more money during the design and engineering process. This is the best place to invest. Force consultants to question all of the rules of thumbs they use; look at the project from the whole building perspective rather than component by component.

For example, bigger more efficient windows allow more daylight, yet can reduce heating and cooling loads resulting in a smaller mechanical system. While the windows costs more, they provide greater first cost savings in other areas and reduce operating costs.

Furthermore, research has shown that giving patients a view can reduce length of stay, drug use and other complications. For more information on this topic, visit [www.pebbleproject.org](http://www.pebbleproject.org).

**MEDICA TOURISM:** What can be done in the area of operating and maintaining an existing facility?

**ALAN WHITSON:** One of the first things I would do is use the Energy Star tools to benchmark my facility by comparing the facility with the energy use of comparable ones across the country. If the building is below the average then commissioning may be the best next step.

Also talk with the local utility about programs they may offer. Many of these programs are free or better yet they provide incentives. From there start to build a plan of attack.

For a specific recommendation, I would suggest replacing all those 32 watt fluorescent lamps with 25 watt low mercury fluorescent lamps with a CRI of 85 or better. The ROI is huge, and the light quality is often improved.

Another recommendation is to install Ultraviolet Germicidal Irradiation in air handling units. Using UV-C lamps can reduce or eliminate mold-related allergies, prevent the development of legionella and other bacteria while reducing energy consumption (i.e. reducing fan energy due to less dense filters).

I've seen projects where the return on investment from energy savings alone exceeded 130 percent. Not to mention the medical benefits.

**MEDICA TOURISM:** Where do you suggest a facility manager turn for more information on energy efficiency? What should a facility manager do to get started on enhancing their energy efficiency?

**ALAN WHITSON:** Education is crucial; the only problem for many facility managers is time. That's why the Corporate Realty, Design & Management Institute offers educational programs in very compact one-day and half-day formats. In the past the Institute has worked with the Northwest Energy Efficiency Alliance and BetterBricks to hold educational programs in the Northwest. We have also worked with professional organizations such as local chapters of the International Facility Managers Association (IFMA) to present educational programs in their area. To see a schedule of our educational programs visit the Institute's website [www.squarefootage.net](http://www.squarefootage.net).

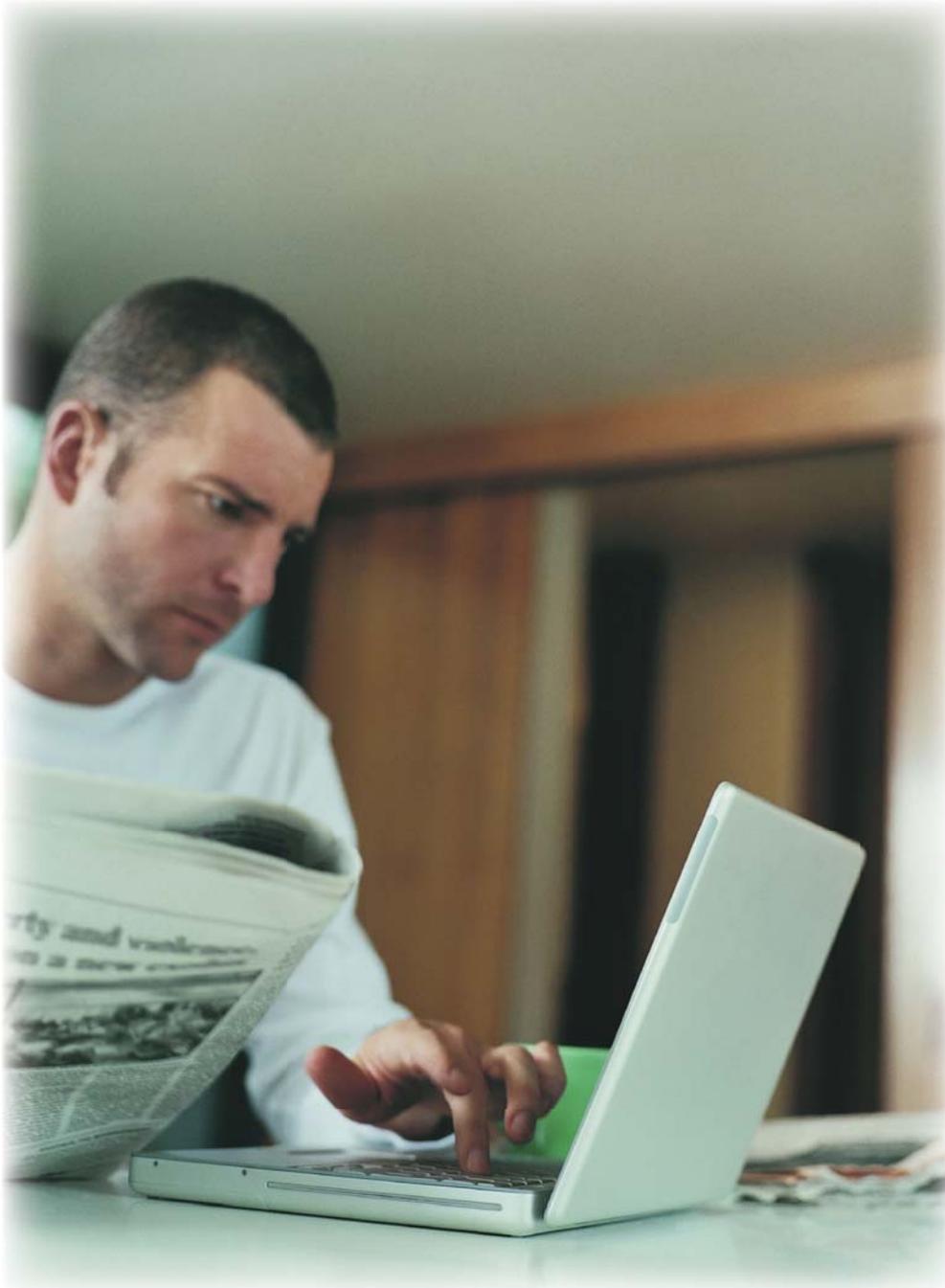
**MEDICA TOURISM:** How can a facility manager get top-level commitment like a broad policy statement from the CEO or a commitment from the CFO to fund cost-effective energy efficiency enhancements?

**ALAN WHITSON:** The easiest and most logical place to start is the annual budget process.

Begin by crafting a mission and policy statement for the CEO to approve during the budget approval process. This document defines the goals, objectives and constraints everyone is operating under during the budget period.

It should include the minimum acceptable return on investment for projects (this is called the hurdle rate) to reduce operating costs. Given the financial structure of most hospitals this should be about 10 to 12 percent.

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Some plans include how the savings will be allocated. For instance, say Project “A” reduces the hospital’s energy bill by \$10,000 a month. The savings could be split 70 percent to the hospital and 30 percent retained by the facility department to fund additional cost reduction projects not currently in the annual budget.

The savings from these “projects of opportunity” could then be used to fund other projects. Besides creating a funding tool, it eliminates the “spend it or lose it” budget games.

Another benefit in this process is that it gives the facility manager an opportunity to have a meaningful and objective discussion with the CEO and the CFO about these issues.

**MEDICA TOURISM:** What kinds of non-energy saving benefits/reasons would you suggest top management focus on for creating sustainable hospitals?

**ALAN WHITSON:** Let’s begin by defining a sustainable hospital as an environmentally responsible, profitable and healthy

ingly high rate.

Second, benchmark your existing energy use. The EPA’s Energy Star program is a great place to start. You cannot improve what you do not measure.

### *How can sustainability be incorporated when working with a limited budget? How should hospital owners spend their money?*

the top of my list. The longer you can keep a floor covering on the floor, a lamp burning, or the roof on your building, the better the impact on the environment and the bottom line. However, that assumes you are using the best-performing product from the onset.

Second on my list would be the integrated design process. The

place to work and heal. Now add the basic medical tenet of “first, do no harm.” While these words are simple, they make a very compelling case. Hospitals are not soft drink bottling plants; hospitals are a core element of our society and as such must be examples of environmental responsibility.

For cold hard facts, over 100,000 people die each year in hospitals from nosocomial infection. Twenty percent of these can be traced to infections caused by exposure to construction in the hospital. Health care workers are exposed to more toxic materials than almost any other worker in the country, very often needlessly. So I would begin in the areas of housekeeping, operations and maintenance.

The issue of water use in hospitals also is starting to get management’s attention. A 300-bed hospital consumes 33,500,000 gallons of water each year. Current estimates are that a quarter of that is wasted. I believe the number is closer to 30 percent. This is literally money going down the drain.

There are hospital specialists available to help. To learn more, contact Sharon Graugnard at [sharon@volantstrategies.com](mailto:sharon@volantstrategies.com).

**MEDICA TOURISM:** What are a few simple approaches that can be relatively easy to implement to reduce energy in an existing facility?

**ALAN WHITSON:** First, do the things you should already be doing. For example, make sure that dampers are not stuck in the open or closed position, system set points are correct, and change air filters at the correct interval. There are hundreds of preventive and regular maintenance items that when neglected can devour energy and water at an alarm-

**MEDICA TOURISM:** What are some of the most important factors architects and engineers need to consider when designing a facility and striving for sustainability?

**ALAN WHITSON:** While most people think recycled content is the most important factor, longevity or long product life is at



idea is to get all of the players together at the very beginning and define the goals, objectives and constraints for the project. A good example of how this can work is the Center for Health & Healing at the Oregon Health & Science University in Portland, Oregon.

Third, set big audacious goals. That's what they did at the Center for Health & Healing. Too often, architects and engineers settle for "good enough."

Fourth, look outside of the health care paradigm. A lot of very good design and engineering work has been done in hotels, data centers and research facilities; it is criminal to ignore it.

**MEDICA TOURISM:** How can sustainability be incorporated when working with a limited budget? How should facility owners to spend their money?

**ALAN WHITSON:** It's a myth that sustainability costs more. If it does, you did it incorrectly or you valued something else in the project more than sustainability, which is often the case. I would encourage owners to spend more money on design and engineering. By the time you have spent half your architectural and engineering budget, more than 90 percent of your operating costs are locked in. The best value for an owner's money is intensive energy modeling and commissioning.

**MEDICA TOURISM:** How can facility managers encourage CEOs to invest in energy-efficient improvements?

**ALAN WHITSON:** Show them the money. Since labor costs dominate the expense side of the ledger, it is hard to get anybody's attention about energy costs. One trick is equating energy savings to revenue. Another powerful tool is to explain the consequences of not accepting recommendations. Say you need \$100,000 for a project that will save \$20,000 a year. The equipment will last more than 25 years, so for our analysis we will make the investment horizon 25 years and assume that energy costs will increase at 5 percent a year. During our 25-year investment horizon, our project will save \$954,541.98

and will provide an internal rate of return of 24.7 percent.

What are the consequences of not accepting your recommendation? \$358,276.64. Let me describe what this number means and then I will illustrate how to calculate it.

If the CEO rejects your project, she will have to put \$358,276.64 into an account earning 5 percent per year for 25 years to offset the savings you would have achieved with your project. Now, if we convert that savings into an equivalent amount of revenue, assuming a total margin of 3.9 percent – the median for U.S. hospitals – your CEO will need \$9,186,580.51 in additional net revenue that year to fund that \$358,276.64.

The number crunching is straightforward.

I took the \$20,000 a year in energy savings and increased it by 5 percent each year for the increase in energy costs. Then I discounted that cash flow at 5 percent to get the present value of the 25 years of energy savings (\$458,276.64). Subtract from that the \$100,000 initial investment and you get \$358,276.64 – the project's net present value.

**MEDICA TOURISM:** Why should people in the industry care about creating sustainable hospitals when the focus should be on healing the patient, not the environment?

**ALAN WHITSON:** It has been my observation that health care organizations that are concerned about their impact on the environment tend to do a better job healing their patients. The people that run the Fred Hutchinson Cancer Research Center, Seattle have a great perspective on this issue. Every dollar they can save is another dollar the "Hutch" can invest in cancer research.

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**ABOUT THE EXPERT:** Alan Whitson is president of Corporate Realty, Design & Management Institute in Portland, Oregon. He has written books and speaks frequently on sustainability-related issues. Ask Mr. Whitson about health care facility design, construction and operations at [awhitson@square-footage.net](mailto:awhitson@square-footage.net) or Michelle Murphy at [michelle@emlenpub.com](mailto:michelle@emlenpub.com) with "Expert Question" in the subject line. **IMAGE CREDITS:** Photos courtesy of [www.unicornchildrensfoundation.org](http://www.unicornchildrensfoundation.org), [blog.nielsen.com](http://blog.nielsen.com), and [www.nhsocal.com](http://www.nhsocal.com).