



BETTERBRICKS
Bottom line thinking on energy.

HEALTHCARE: A BUSINESS AND ETHICAL CASE FOR SUSTAINABILITY

By David Ray for BetterBricks

INTRODUCTION

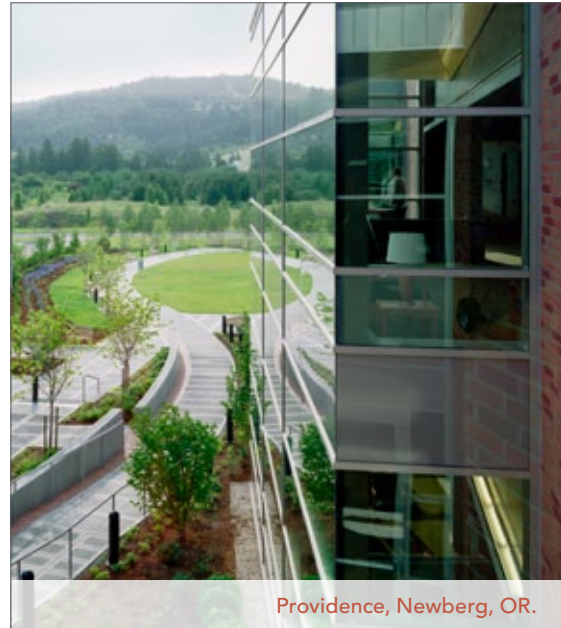
The U.S. healthcare sector is at a crossroads in resource management. Accounting for nearly a tenth of the country's CO₂ emissions and facing rising energy costs coupled with lower reimbursements, climate change legislation and outdated 24/7 facilities, the healthcare industry is embracing energy efficiency as a viable and cost effective path to improve margins and reduce the impacts from their own building operations. "Every dollar saved on energy costs is a dollar that is devoted to improving medical care for our patients," declared Dr. Herbert Pardes, President and CEO of New York Presbyterian Hospital.¹

In the United States the healthcare sector ranks second, after fast food, as the most energy-intensive industry, spending \$8.5 billion on energy every year.² Hospitals alone spend roughly \$5 billion a year on energy costs.

Given that hospitals have high energy demands for heating and cooling; ventilation and lighting; and plug loads, they consume almost twice the energy per square foot as traditional office space and produce more than 30 pounds of CO₂ per square foot.³ Moreover, The Department of Energy (DOE) reports that hospital energy costs have risen 56 percent from \$3.89 per square foot in 2003 to \$6.07 per square foot in 2008 with no end in sight.⁴

"Leading healthcare systems now recognize that to provide the highest quality care, they have a moral and ethical responsibility to contribute to health—inside and outside hospital walls. This means taking concerted action to reduce CO₂ emissions that lead to complications in health."

CEOs are making a strong business case for energy efficiency as a cornerstone of their sustainability policies. They are also considering the economic, social and even personal impacts of their practices. As a result, healthcare thought leaders have adopted a broad, systems-thinking approach to sustainability. The result: *energy management now sits side-by-side with clinical and financial governance.*



Leading healthcare systems now recognize that to provide the highest quality care, they have a moral and ethical responsibility to contribute to health—inside and outside hospital walls. This means taking concerted action to reduce CO₂ emissions that lead to complications in health. Forward thinking healthcare

¹ ENERGY STAR® Success Story: New York-Presbyterian Hospital: http://www.energystar.gov/index.cfm?c=healthcare.bus_healthcare_ny_presb_hospital

² Healthy Hospitals, Healthy Planet, Healthy People: Addressing Climate Change in Healthcare Settings; World Healthcare Organization and Health Care without Harm; http://72.32.87.20/lib/downloads/energy/Healthy_Hosp_Planet_Peop.pdf

³ U.S. Department of Energy; <http://www.energy.gov/news/7363.htm>

⁴ U.S. Department of Energy: Energy Efficiency and Your Hospital's Bottom Line; http://www1.eere.energy.gov/buildings/energysmarthospitals/bottom_line.html

Yet there are many healthcare organizations that are acting too slowly or falling short on execution. Many have not integrated sustainability into their business functions nor developed a plan to measure, track and report their sustainability efforts. Compounding the measurement problem are variables such as patient load, weather, additions or changes to buildings and medical equipment. Furthermore, many organizations are focused on individual projects rather than developing a process to change system-wide business practices that impact their sustainability footprint. They are still asking whether or not dedicating effort and staff towards strategic resource management (SRM) is a good business investment and are struggling to create and manage organization-wide sustainability initiatives.

These are critical issues for healthcare systems as they consider ways to reduce their carbon footprint, use resources more effectively and improve patient and community health. Through the BetterBricks initiative, the Northwest Energy Efficiency Alliance (NEEA), a non-profit organization funded by Northwest electric utilities, has been working for the past four years with healthcare systems, utilities, market specialists and partners to validate the business case for change and implement long-term solutions for strategic energy management.

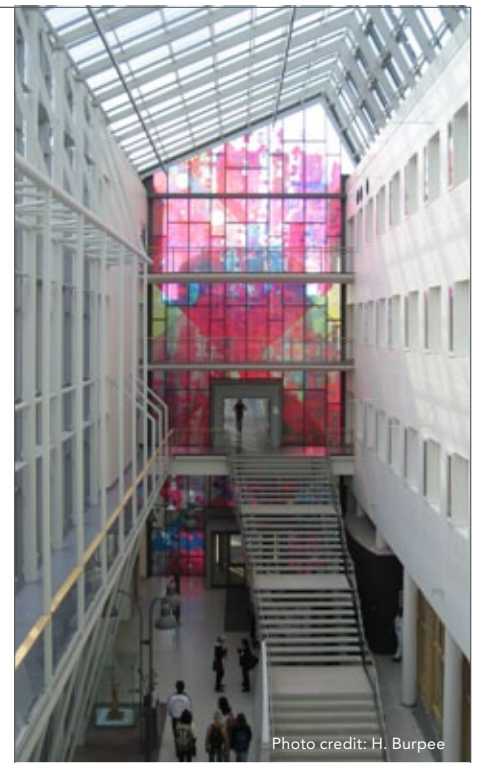


Photo credit: H. Burpee

Akershus Nurse's Station, Oslo, Norway

REDUCING GLOBAL EMISSIONS IS A HEALTH ISSUE

While health systems typically focus on the needs of their local communities, their impact on the environment is global. According to the World Health Organization (WHO), "a warmer and more variable climate threatens to lead to higher levels of some air pollutants, increase transmission of diseases through unclean water and through contaminated food, to compromise agricultural production in some of the least developed countries, and increase the hazards of extreme weather."⁵ Given the correlation between warmer temperatures and rising CO₂, the healthcare industry's mission must account for environmental externalities beyond the hospital and far beyond their communities.

In the U.S., the DOE launched in 2008 its own EnergySmart Hospitals initiative to increase the use of energy efficient technologies in hospitals across the United States. For the nation's 8,000 hospitals the EnergySmart Hospitals initiative targets 20 percent improved efficiency in existing hospital facilities and 30 percent improvement over current standards in new construction.

In the Northwest, a region leading the sustainability movement, The Northwest Energy Efficiency Alliance's BetterBricks initiative is partnering with the American Society of Healthcare Engineering's (ASHE) Energy Efficiency Commitment (E2C) initiative—launched in 2006—to encourage members to benchmark the energy use of their facilities using ENERGY STAR® Portfolio Manager and will recognize organizations that reduce energy consumption by 10 percent or better.

Outside of the United States, the National Health Service (NHS) in the United Kingdom has calculated its carbon footprint at more than 18 million tons of CO₂ each year—25 percent of total public sector emissions. As the largest organization in the UK, the NHS has recognized the urgency of climate change, stating that taking action now will immediately lead to health benefits, including reduced risk of acute respiratory infections, obesity, diabetes and heart disease. NHS's actions have been driven by The Climate Change Act, introduced by the British government in 2008, setting country-wide targets to cut

⁵ Healthy Hospitals, Healthy Planet, Healthy People: Addressing Climate Change in Healthcare Settings; World Healthcare Organization and Health Care without Harm; http://72.32.87.20/lib/downloads/energy/Healthy_Hosp_Planet_Peop.pdf



PeaceHealth St. Joseph Medical Center, Bellingham, WA

carbon emissions by at least 80 percent by 2050, with a minimum reduction of 26 percent by 2020.⁶

Global Fortune 500 companies have also taken notice by realizing that sustainability is a business opportunity. In 2009, GE and Asklepios Hospital Group in Germany teamed up to renovate and expand a large hospital in Hamburg. GE Chairman and CEO, Jeff Immelt remarked, "A well-preserved environment is essential for good health. By working with our customers and partners in the conception and design of

healthcare facilities, we aim to reduce energy usage, conserve water, generate renewable energy onsite, maintain air quality, reduce waste, increase staff productivity and improve patient satisfaction."⁷

To measure the health impacts of CO₂ emissions, Practice Greenhealth has developed the Energy Impact Calculator (EIC). Based on the U.S Environmental Protection Agency (EPA) analysis of power plant emissions of sulphur dioxide, nitrous oxide and mercury, the EIC estimates premature deaths, chronic bronchitis, asthma attacks and more by kilowatts per year used by hospitals. For example, "a typical 200-bed hospital in the coal-powered Midwest using seven million kWh is responsible for more than \$1 million/year in negative societal public health impacts (\$0.14kWh) and \$107,000/year (\$0.01532/kWh) in direct health care costs."⁸

REDUCING COSTS

According to a 2008 research paper by McKinsey Global Institute titled, "How the World Should Invest in Energy Efficiency," efforts targeting cost-effective opportunities in energy productivity could halve the growth in energy demand, cut emissions of greenhouse gases, and generate attractive returns.⁹

For healthcare systems the timing for cost-saving, energy efficiency efforts could not be better.

Trustee Magazine reported in 2009 that hospitals are experiencing a tight revenue crunch. "Payer mix is shifting away from relatively lucrative commercial insurers toward Medicare, Medicaid and self-pay. Charitable donations and investment income are down, and improvement projects involving capital outlays for IT, facilities and equipment have been put on hold."¹⁰ The median bad debt percentage is at historic levels, and access to capital has become more strained and expensive throughout the recession.

To reduce costs healthcare systems are focusing on energy efficiency. The American Society for Healthcare Engineering and Johnson Controls released a study in 2008 showing that healthcare executives place a

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(Practice Green Health)

⁶ Saving Carbon, Improving Health: NHS Carbon Reduction Strategy for England; January http://www.climateandhealthcare.org/uploads/docs/200901_UK_NHS_carbon_reduction.pdf

⁷ GE and Asklepios Hospital Group Announce their First European Collaboration to Reduce Hospital Environmental Impact; July 2009: http://files.gereports.com/wp-content/uploads/2009/07/press-release_green-hospital-project_en.pdf

⁸ Calculate how your energy use impacts health; Practice Greenhealth's Healthcare Energy Impact Calculator (EIC) <http://www.eichealth.org/>

⁹ How the world should invest in energy efficiency by Diana Farrell and Jaana K. Remes; July 2008; McKinsey Global Institute http://www.mckinseyquarterly.com/Economic_Studies/Productivity_Performance/How_the_world_should_invest_in_energy_efficiency_2165

¹⁰ 2010 AHA Environmental Scan By Gene J. O'Dell & Lee Ann Runy; Trustee Magazine http://www.trusteemag.com/trusteemag_app/jsp/articledisplay.jsp?dcrpath=TRUSTEEMAG/Article/data/09SEP2009/0909TRU_fea_gatefold&domain=TRUSTEEMAG

higher priority on energy efficiency than executives in other industries. 65 percent of healthcare respondents called energy efficiency “extremely important,” or “very important,” compared with 57 percent of respondents from different industries. Two thirds of healthcare organizations plan to spend capital on energy efficiency in the year compared with 56 percent in the multi-industry survey. Their prime motivation was not to save the earth. 59 percent responded that the need to control costs is a greater motivator than environmental responsibility.¹¹ For a hospital operating at a three percent



Legacy Mt. Hood, Gresham, OR

margin, energy savings of \$200,000 equal more than \$6 million in revenue. Dr. Peter Glynn, former CEO of Kingston General Hospital in Ontario, Canada supports the business case for sustainability: “With limited resources available for direct patient care, it’s vital that hospitals investigate all possible opportunities to find operating savings. We’re pleased that this [energy efficiency] initiative has found efficiencies that will help us spend less on energy. The bottom line is that more money is available for patient care and clinical programs. We see this as a win-win situation for the environment and the patients we serve.”¹²

HEALTHCARE SYSTEMS TAKE ACTION

For more than four years, through the BetterBricks initiative, NEEA has been helping executives and facility managers at leading hospitals and health systems take a more strategic approach to energy and resource use. Energy costs which typically represent up to three percent of a hospital’s operating budget can be reduced easily by 10 to 30 percent at little or no cost. But one of the challenges of managing energy in a large organization is the opportunities for improvement are diffuse. Many seemingly small actions impact energy use. NEEA’s approach influences business practices across an entire organization including how hospitals tune-up, operate and maintain equipment and systems; how they upgrade and purchase equipment and services; and how they design and construct buildings. The

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collaboration between healthcare systems and NEEA has produced impressive results.

Legacy Health in Oregon has been working on a strategic resource management plan for the past three years, yielding potential and realized savings of more than \$1.3 million per

year. The plan supports Legacy’s core mission—quality of patient care, environmental stewardship, and progressive action. Now on track to reduce energy use intensity by 10 percent per square foot, Legacy is a model health system for sustainability and resource management.

Providence Health and Services, which operates approximately 18 facilities in the Northwest, adopted an energy management initiative in 2002 to reduce energy costs an additional 10 percent over five years.

¹¹ Healthcare Executives Place Higher Priority on Energy Efficiency Than Others, Research Shows. Energy Weekly News, August 4, 2008

¹² Kingston General Hospital Remedies High Energy Costs, Natural Resources Canada; <http://oee.nrcan.gc.ca/Publications/commercial/m27-01-1453e.cfm?attr=20>



St. Alphonsus Regional Medical Center, Boise, ID

In 2004, the system was named ENERGY STAR® Partner of the Year for the results achieved through this initiative. Providence reduced system-wide energy use by 5.7 percent in 2008, even as the square footage of its facilities increased by 17.4 percent. The organization has saved more than \$13 million since a formal energy office was established in 2004.

PeaceHealth, headquartered in Bellevue, WA, with 925 beds and serving 53,000 inpatients and a half a million outpatients in 2009, determined that a cumulative 10 percent reduction in energy use could be attained by incremental efforts over three years leading to a savings of

up to \$800,000 a year system-wide. In the first year of implementing its Strategic Energy Management Plan, the organization achieved a three percent reduction in energy consumption, representing \$240,000 in energy savings. "An energy management strategy is an opportunity for terrific hospital savings and a system-wide plan provides a strong focus, synergy and a way to parlay the knowledge of our facilities people across our entire hospital system," stated Medrice Coluccio, former Columbia Region PeaceHealth CEO.

Northwest Healthcare's Kalispell Regional Medical Center in Montana with 174 beds identified more than \$63,000 in total annual savings, reducing energy use by 1.6 million kWh. The efficiency efforts included retuning or replacing a water-source heat pump; exhaust fan scheduling; and temperature controls system. HVAC systems and energy-tracking software now have the attention of senior management. In fact, one of Northwest's core values clearly states: "We are committed to efficiently managing our resources for the benefit of the community and the organization." According to Facility Director M.T. Chitwood, the organization is now paying consistent attention to energy management. Northwest Healthcare is using the Energy Expert system to evaluate energy performance and taking quick, corrective action. "The procedural/behavioral change in plant operations," reported Chitwood, "has resulted in five to six percent energy savings—just by operating the system more efficiently using Energy Expert as a feedback tool."

In 2009 Saint Alphonsus Regional Medical Center, a 387-licensed bed hospital in Boise, ID, opened the first medical office building in Idaho to register for gold LEED certification. "It combines the principles of a healing environment with environmental sustainability," declared Janelle Reilly, Saint Alphonsus Chief Operating Officer. This new building is further testament to Saint Alphonsus' long-standing commitment to sustainability and energy efficiency. For the past three years, Saint Alphonsus has been working with NEEA's BetterBricks to develop and now implement a Strategic Energy Management Plan. The organization has identified key operations and maintenance opportunities. In one case a scheduling change for chiller operations realized more than \$80,000 in savings. "We now have a measurement system in place—Energy Expert—to document our success. With the savings we've achieved so far, we were able to make the case to senior management to contract for a Resource Conservation Manager. Now we will have a system and personnel in place to really ramp up our energy savings," said William Morgan, Engineering Manager of Saint Alphonsus and previous president of the American Society for Healthcare Engineering.

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**– William Morgan, Engineering Manager,
St. Alphonsus Regional Medical Center**

A FOCUS ON PATIENT CARE AND ENERGY SAVINGS

Energy efficiency translates to more than just cost savings. A joint study in 2005 undertaken by the University of Oregon and leading healthcare designers Zimmer Gunsul Frasca Architects revealed that a patient room providing good outdoor views and daylighting can increase patient well-being. This psychological state results in reduced stress and anxiety, lower blood pressure, improved post-operative recovery, reduced need for pain medication and shorter hospital stays.¹³ When daylighting is used to reduce ambient electric lighting, energy savings can be as high as 87 percent.

Another study by The Center for Health Design and The California Health Care Foundation showed that the physical environment of health care facilities affects patients, staff and families by impacting patient safety and quality of care.¹⁴ Recent analyses of the physical features of health care facilities have primarily focused on acute care settings, but there is some evidence that the physical environment plays an important role in outpatient settings as well. Other intangibles include better staff retention and community stewardship.

To realize these patient, staff and operational benefits, the University of Washington's Integrated Design Lab, in collaboration with a team of experts in design, engineering, operations, and hospital ownership have developed research directed at much higher performing buildings—targeting both energy performance and interior environmental quality, for an overall premium of about one percent of the total project cost.

Two acute care hospital prototypes have been developed at a schematic level of architectural and mechanical detail. These schemes were able to achieve a 60 percent energy reduction from typical operational hospitals in the Pacific Northwest (nicknamed "Target 100," since they target 100 KBtu/SF per year—a considerable goal given the region's average of 263 KBtu/SF per year.) Heating as the predominant

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energy load became the largest target opportunity for energy reduction. The team turned to Scandinavia for inspiration since hospitals in this region consistently use half to one quarter the amount of energy used in their U.S. counterparts.

One result of this highly integrated, high performance design is a large change in the dominant fuel source. Typically in hospitals, the split in fuel use is approximately 40 percent for electricity and 60 percent for natural gas (mainly for heating). This relationship between the demands for electricity and



Legacy Good Samaritan Healing Garden, Portland, OR

¹³ A 2005 study jointly undertaken by the Energy Studies in Buildings Laboratory, Department of Architecture, University of Oregon (G.Z. Brown, Jeff Kline, Gina Livingston, Brooks McDonald, Crawford Smith, Mark Wilkerson) and Zimmer Gunsul Frasca Architects LLP

¹⁴ Improving the Patient Experience: Best Practices for Safety-Net Clinic Redesign-March 2009; <http://www.chcf.org/topics/view.cfm?itemid=133881>

natural gas change significantly in the Target 100 options. There is a large reduction in natural gas consumption, and a modest reduction in electricity consumption with a fuel split of approximately 81 percent electricity and 19 percent natural gas.

The energy options would save between \$500,000 and \$700,000 annually on total energy costs compared to their baselines based on simple Puget Sound Energy non-negotiated rate structures. In a four percent operating environment, it takes \$25 of gross revenue to generate \$1 of net operating income. In order to accrue \$500,000–\$700,000 of net operating income, \$12,500,000–\$17,500,000 worth of services would have to be delivered annually. The initial cost investment would take less than six years to recover, using the most conservative estimates.



Providence Newberg Operating Room, Newberg, OR

Adopting these strategies saves 7500 tons of carbon¹⁵ entering the atmosphere annually (based on national electrical source assumptions). If only one project attains this goal it would be equivalent to taking about 1300 passenger cars off the road¹⁶ or planting 300,000 trees.¹⁷ This is a monumental amount of carbon savings—and it is an attainable, affordable goal that can be achieved if a commitment is made early by a motivated, integrated design, construction and ownership team.

LESSONS LEARNED

In the last four years assisting multiple healthcare organizations, NEEA has developed several critical success factors for implementing Strategic Energy Management Plans. These include:

- **Executive management must lead the sustainability effort.**
In a report by MIT Sloan Management Review detailing how to institutionalize a sustainability agenda throughout an organization, corporate and thought leaders were adamant that “top-down vision, commitment and leadership were critical for success—and the absence of top-down commitment was one of the greatest impediments to successful execution.”¹⁸ Sustainability must be a part of the health system’s “DNA” and viewed as a long term process rather than a discrete project.
- **A Strategic Resource Manager must drive the sustainability process**
One of the most important commitments executives can make is to invest in a Strategic Resource Manager (SRM). To be most effective, the SRM should report to finance or operations, working closely with facility managers and executives alike to manage energy resources. The SRM is responsible for system-wide efforts to measure, track and report energy savings.
- **Strategic Energy Management requires systemic business change**
Energy management must be embedded into key business practices. Practice change covers all applications of energy management—starting with no-cost/low-cost tune-ups for existing

¹⁵ Hatten, M., and J. Jennings. “2009 AIA Portland Design Awards CO₂ Calculator.” 2009.

¹⁶ United States Environmental Protection Agency. “Emission Facts: Average Annual Emissions and Fuel Consumption for Passenger Cars and Light Trucks” <http://www.epa.gov/oms/consumer/f00013.htm>.

¹⁷ Trees for the Future: “How to calculate the amount of CO₂ sequestered in a tree per year” <http://www.treesfff.org/resources/information.htm#agfotech>. Tree offset calculation is based on a tree planted in the humid tropics absorbing on average 50 pounds of CO₂ annually over 40 years.

¹⁸ The Business of Sustainability, MIT Sloan Management Review, <http://sloanreview.mit.edu/special-report/the-business-of-sustainability/>

equipment and systems and extending to new construction and major renovations; financial analysis and procurement practices; and measurement and reporting of results.

- **Explicit performance goals motivate practice change and sustain organizational commitment**
Clear performance goals are mandatory for successful energy management. They accelerate decisive action, document success and allow for course corrections as needed. Explicit performance goals motivate practice change and sustain organizational commitment. Be sure to have measurement and evaluation systems in place to evaluate progress.
- **Alliances, both internal and external, are critical for success**
Organizations pursuing long-term energy management must build alliances that fill gaps in technical or operational capabilities. With new domestic and international regulatory requirements, products and shifting consumer needs, organizations must develop effective partnerships with stakeholders, suppliers, utilities, regulators and influencers to meet these changes.

CONCLUSION

A 2009 article in the Harvard Business Review titled, "Why Sustainability is now the Key Driver of Innovation," makes a bold statement that "only companies that make sustainability a goal will achieve competitive advantage."¹⁹ For companies and healthcare organizations alike, becoming environmentally friendly can lower costs and increase revenues. For any healthcare organization a healthy planet supports its mission of providing the highest quality care. Writing for *The Lancet*, Margaret Chan of the WHO notes, "cutting greenhouse gas emissions can represent a mutually reinforcing opportunity to reduce climate change and to improve public health."²⁰ The cost savings from sustainability programs at healthcare systems are well-documented. Most efficiency investments yield returns of 10 percent or more. Many of the efficiency practices are no-cost/low-cost improvements. There is no doubt that sustainability is a major force to be reckoned with—one that will determine how healthcare systems think, act, manage and compete. It is time for CEOs and senior executives of healthcare systems to boldly embrace sustainability management and make effective changes that lead to a stronger balance sheet and a healthy planet.

Contact Information

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¹⁹ Why Sustainability is now the Key Driver of Innovation, Harvard Business Review
<http://hbr.org/2009/09/why-sustainability-is-now-the-key-driver-of-innovation/ar/>

²⁰ Cutting Carbon, Improving Health, *The Lancet*, Vol 374, Dec. 5, 2009 <http://download.thelancet.com/pdfs/journals/lancet/PIIS0140673609619930.pdf?id=e16241398b8eb460:75f96a02:126b8fbf429:-a8b1265826832872>