



Green+ Hospitals

Sustainable Healthcare Infrastructure. More than just Green.

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SIEMENS

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Ecological Challenges Today

Climate change is probably the greatest and most demanding challenge that confronts mankind today. To mitigate global warming to the greatest extent possible, a promising approach is to decouple economic growth from energy usage. Two megatrends, however, make it increasingly difficult to separate economic growth from energy use: demographic change and increasing urbanization. Both have resulted in skyrocketing energy costs, shortages of natural resources, including water and myriad other challenges.

Ecological and Economical Demands

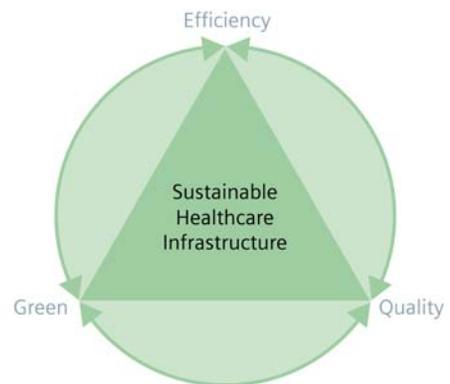
Like CEOs of other industries, healthcare CEOs need to cope with various challenges in order to be sustainably profitable and thus fulfill economic as well as ecological requirements. Main drivers in the healthcare field are:

- increasing energy costs
- regulations on CO₂ emissions
- financial limitations through the healthcare system
- enhanced competition between healthcare providers

An initiative called Green+ Hospitals was set up by Siemens to address these challenges. The result is comprehensive support for healthcare providers considering complete integration of products and solutions for hospitals developed by Siemens.

Sustainable Healthcare Infrastructure

The Siemens "Green+ Hospital" approach not only focuses on the obvious "green" aspects but also on a broad variety of levers required to address the various challenges. Thus, the Siemens Green+ Hospital solution encompasses the following critical success factors for sustainable healthcare infrastructure:



Green

Environmental care, e.g. by installed state-of-the-art energy technologies, implemented environmental care programs and/or material usage policies

Quality

Increased patient care quality and comfort, e.g. by healthier and more convenient imaging procedures and/or recovery supporting ambience

Efficiency

Increased profitability, e.g. by optimized workflows, efficient support processes, or integrated low-energy imaging systems

Understanding these three elements results in what we consider to be our sustainable solution for healthcare infrastructure. Because sustainability means much more than saving energy and lowering emissions. Quality and efficiency are additional success factors to be taken into account. Being active in just one of the three areas – either ecology, or quality or efficiency – is not sufficient to meet the long-term goals. There certainly are interdependencies, but it is essential to proactively improve each of the three components to maximize the impact.

A Green+ Hospital designed by Siemens addresses all of the three success factors comprising products and solutions from different application areas: energy generation and distribution, building automation, IT and communications infrastructure, green IT, and medical technology.

Green

One success factor of a Green+ Hospital deals with ecological aspects, which can be summarized under green technologies concerning efficient energy consumption. One part of this certainly is a Green Building – a structure designed to be environmentally friendly and resource saving throughout its entire life cycle, from design and implementation of the building and its components to its disposal and recycling.

Positive Effects Regarding Cost Efficiency

Hospitals generally represent some 6%¹ of total energy consumption in the utility buildings sector. The great majority of the energy used within a hospital is converted from natural gas and electricity. The most important internal flows of the converted energy are heat, cold, electricity, and compressed air, which are mainly used for HVAC (heating, ventilation, and air conditioning), lighting, IT, and building automation. Medical equipment contributes to the general building electricity consumption.

Siemens offers innovative financing and user models in the energy section that can be summarized under the "Contracting" market segment. Siemens energy-saving contracting solutions allow healthcare facilities to use complete Siemens portfolio installations that lower the total building energy consumption and thus energy costs more than 25 percent² without customer investment. Siemens guarantees defined cost reductions to the hospital. In this financing model, the Siemens installations are paid by the budgetary amount saved for the duration of the contract. With regard to medical equipment, successful real-life examples in innovative medical technologies show that significant energy savings and cost reductions are possi-

ble. Medical imaging systems by Siemens Healthcare even show the potential to amortize within years, considering the total cost of ownership (TCO). MRIs, for instance, show the potential for savings at installation, during operation and maintenance and even at recycling. Thus, innovative technologies support a facility's clinical and financial success with savings of up to 25 percent² on installation costs, power requirements, and construction. For example, if a MAGNETOM® ESSENZA replaces an existing MRI, it can reduce energy consumption by up to 50 percent² during operation thanks to its innovative high-performance electronics. With a magnet featuring zero helium boil-off technology, even maintenance costs can be reduced. There is no need to regularly refill the expensive cooling substance, and the system is always ready for operation, maximizing uptime. Zero helium boil-off can save helium costs of 6,000 Euro² per year.

For Proven Excellence medical systems parts or complete products (that fulfill the warranty standard of new systems) are re-used as part of a circular economy. The PE (= Protect Environment) Impact process even extends one step further: it lengthens the life cycles of healthcare systems. This leads to economized resources, which result in a reduction of around 20,000 tons of CO₂ per year. This equals the CO₂ storage of approximately 32 hectares of tropical rain forest³. Additionally, the PE Impact program will reforest and sustainably protect 32 hectares of rain forest per year in order to double the reduction of CO₂ emission.

As can be seen, manifold aspects contribute to an ecologically efficient operation of a hospital.

¹ Leonardo Energy: Power Quality Utilization Guide, Rob van Heur, January 2008

² Results may vary. Data on file.

³ Source: KfW development bank, "Tropenwaldschutz als Klimaschutz", Nov. 2008

... plus Efficiency

A Green+ Hospital is more than just an ecologically efficient building. A holistic view on efficiency as well as processes is essential, including planning, equipment, system integration, IT, and operation. Optimized medical and support processes are required to leverage the full potential of efficiency and environmental care. Optimized workflows contribute to maximize hospital efficiency by increasing utilization¹ of human resources and medical equipment, and by reducing required floor space².

Cost Reduction Plus Efficiency Rise

Clinical processes certainly are most important to consider when optimizing the process efficiency of a hospital. There is impact on utilization and floor space, but also automated patient management systems can increase efficiency significantly by shortening the length of stay of patients.

Workflows can also be optimized by support of IT and technology. Siemens Enterprise Communications offers latest IC network technology as infrastructural basis for workflow improvement. There is a high potential for improving efficiency in hospitals with respect to support processes. Essential functions like, for example, laundry, maintenance services, and bed management can be much more efficient by support of tracking & tracing

technologies and specific management software.

Moreover, any processes concerning the building like HVAC (heating, ventilation, and air conditioning), lighting, or sun shading show the potential of efficiency improvement when automated and intelligently controlled. The Siemens Industry Sector covers among other things the entire field of Building Technologies and therefore not only addresses the energy consumption in a hospital but also process efficiency.

All of this contributes to cost reduction and efficiency rise. Siemens Healthcare Consulting has in-depth experience in analyzing and optimizing clinical and non-clinical workflows from more than 350 consulting projects. A Green+ Hospital project includes the investigation of efficiency improvement potential and its implementation aligned with the overall strategic "Green+" objectives.

¹ Example for utilization increase: Room and capacity planning of imaging center in the new facilities of a medical center (Siemens Healthcare Consulting project). Utilization of Echo- and MRI-systems could be doubled due to optimized medical workflows.

² Example for floor space reduction: Planning of facilities for an interdisciplinary center of medical specialists (Siemens Healthcare Consulting project). Required floor space could be reduced by 20 percent due to optimized logistic patient flow.

... and Quality

Quality of Patient Care

Ecological and economical efforts are important for a hospital. But as essential as they are, the most important aspect for a sustainable hospital is the quality of patient care.

Innovative medical technologies allow high-quality imaging, which leads to enhanced diagnostic precision, combined with high patient comfort and less waiting. Siemens MRIs, for example, feature Tim™ technology (Tim™: Total imaging matrix), a revolutionary matrix-coil concept that significantly increases scan speed and patient comfort. CT advancements minimize clinically irrelevant dose for spiral examinations and introduce, for the first time, organ-sensitive dose reduction.

Improving patient quality also requires improvement of the communication infrastructure. Ubiquitous* access to patient data, along with alerting devices for patient, secure patient identification, and secure access leads to improved patient treatment and care. In combination with solutions from Siemens modern hospitals can offer a personal bedside TV, individual access to the Internet and/or Intranet. Also a multitude of multimedia Services to get additional revenue direct at the Point of Care.

Sustainability impacts patient health and comfort, which is often improved through fast, efficient treatment and low-dose radiation imaging.

Improvement of Corporate Image

By instituting ecological, efficiency and quality related measures, hospitals also have the chance to receive internationally recognized certification when certain criteria are fulfilled.

These systems measure how well a building or hospital performs across all the metrics that matter most: energy savings, water efficiency, CO₂ emissions reduction, improved indoor environmental quality, or administration of resources and sensitivity to their impacts. And, being a green hospital help create a good reputation, which can attract additional patients. Siemens Green+ Hospitals helps hospitals receive the beneficial green label (e.g. LEED® or German certification 'BUND-Gütesiegel').

* requires internet access

Win-Win-Win-Situation

The Siemens Green+ Hospital addresses all levers to answer today's ecological and economical demands.

Hospitals win because they can

- lower energy costs;
- improve efficiency;
- make their businesses more profitable.

Society wins because of

- improved environmental care programs;
- enhanced living standards.

Patients win because they

- profit from quick workflows;
- receive high-quality medical treatment;
- receive healthier and more convenient medical procedures.

Sustainable Healthcare Infrastructure

Sustainable healthcare infrastructure means the big challenge to unify ecological and economical demands in healthcare.

Siemens supports you in meeting these challenging demands and prepares you for the future — with Green+ Hospitals. With a variety of levers that lead to sustainable healthcare infrastructure. Because a Green+ Hospital means more than saving energy and lowering emissions. Our Green+ Hospitals solutions help you optimize efficiency and increase quality.

Further information: www.siemens.com/hospitals

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