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Issue 54

Debunking myths

Six beliefs holding back sustainable healthcare

SIEMENS Healthineers

Introduction

There is a strong consensus that more sustainable practices are needed in healthcare. The healthcare sector consumes enormous amounts of energy, produces huge emissions, and generates massive quantities of waste. This costs money and damages our planet, which directly impacts the health of people and communities. Paradoxically, the healthcare sector is a major contributor to the very factors that make people sick.

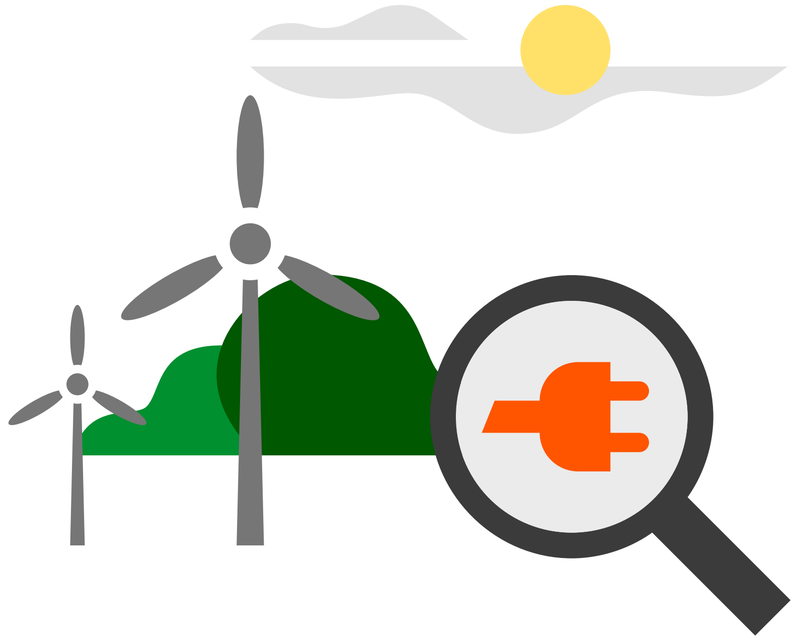
Yet, the healthcare sector has been slow to embrace more sustainable practices. While other industries and sectors have moved rapidly to embrace renewable energy or to more rigorous efforts at recycling and waste reduction, the healthcare sector is more hesitant to change.

Healthcare is in many ways a sector that places a high value on continuity and established processes and protocols. However, there also appear to be a number of widely held beliefs that lead many to resist sustainability measures.

In this paper, we seek to evaluate these beliefs: are they based on fact? Or are they simply “myths”? We also offer examples of how healthcare organizations have taken action and achieved results in ways that debunk these myths.

Myth 1: Solar is too risky.

Hospitals cannot switch to renewable energy because it is too unpredictable and unreliable. And besides, it only works in countries with lots of sunshine.



This myth rests on the belief that because hospitals are energy-intensive structures and they need to provide their services 24/7, the services they provide are too critical to be left to renewable energy, which is seen as erratic and unpredictable.

Reality

Much renewable energy is generated from natural sources like wind and the sun, which fluctuate. But the reliability of power is not a function of individual generation technologies but of the electricity system as a whole.

Today, renewable energy plays a key role in energy systems that are fully able to meet peak demand. In recent years, huge advances have been made to boost the reliability of renewable energy, primarily with energy storage solutions and smart grids. In any event, large institutions like hospitals would continue to have backup energy sources such as generators – as they do today for unforeseen events like power blackouts.

One of the key levers to reaching carbon neutrality is to reduce the reliance on fossil fuels and instead embrace the use of renewable energy generated by, for example, solar, wind, hydro and geothermal energy.

Smart microgrids are one highly effective way to make renewable energy more reliable and flexible. A smart microgrid is a localized energy system that uses advanced technologies to manage energy production, storage, and distribution in real time. It allows hospitals to integrate renewable energy sources like solar and wind while maintaining the steady, reliable power supply they need.

Smart microgrids also offer these features:

- **Energy storage:** Smart batteries store and release energy as needed, ensuring a steady supply during periods of renewable energy variability.

- **Renewable integration:** On-site sources, such as solar panels or wind turbines as well as conventional sources of energy such as diesel generators, are combined with energy storage systems to be more reliable and robust.

- **Advanced management:** An additional advantage of microgrids is their ability to optimize energy usage through advanced energy management systems. By monitoring and balancing energy flows in real time, smart microgrids reduce overall energy consumption. Real-time data and predictive analytics optimize energy flows, balancing renewable energy, stored energy, and backup systems.

- **Grid interconnectivity:** Microgrids can seamlessly integrate with the external grid, providing additional stability.

Example

Kaiser Permanente's Richmond Medical Center was the first hospital in California to implement a microgrid that connects renewable energy and battery storage to a pre-existing, diesel-fueled backup power system.[1] This project demonstrated the ability of a microgrid to support and sustain the functions of a healthcare facility and to overcome barriers to its deployment. As a result, Richmond Medical Center stands to save an additional 2.63 MWh of energy per year, resulting in annual savings as high as US$394,000. In addition, the Richmond Medical Center's microgrid is able to store one megawatt-hour of energy in batteries. In the event that a power outage were to occur, the microgrid can furnish power to the 50-bed acute care facility allowing the hospital to operate as an energy island and ensuring that critical systems continue to function.

This shift toward sustainable energy is not limited to regions traditionally known for their abundant sunlight. Take Castle Hill Hospital, part of the NHS Hull University Teaching Hospitals, located in the United Kingdom – a country not typically associated with year-round sunshine. After installing 11,000 solar panels, the hospital now generates its own electricity, effectively operating off-grid during summer days,[2] while having the flexibility to tap into traditional energy sources during periods of low solar generation when needed. This achievement not only marks a major step toward the institution's goal of becoming carbon neutral by 2030 but also brings significant financial benefits. The hospital saves between £250,000 and £300,000 each month on its energy bills, a tangible reminder that the path to sustainability can yield both environmental and economic rewards.

[1] *betterbuildingssolutioncenter.energy.gov/implementation-models/kaiser-permanente-pioneers-californias-first-medical-center-microgrid*

[2] *hey.nhs.uk/news/2022/05/09/castle-hill-hospital-now-completely-powered-by-its-own-solar-energy/*

Myth 2: Sustainability costs too much money.

Investing in sustainable technology and infrastructure is something we cannot afford in the current economic environment.

The basis of this myth is the financial pressures that healthcare providers are facing. These pressures are very real and cannot be dismissed. Any large-scale investments must be carefully scrutinized. Another dimension of this myth is that investments in things like waste reduction and energy efficiency are discretionary expenses; indulgences that can be undertaken when times are good but not when financial pressures are mounting. Both of these arguments are, however, not supported by data. The focus on short-term cost reduction overlooks a much larger, more compelling picture: sustainability drives long-term economic growth, operational efficiencies, and resilience in the face of global challenges.

Organizations that hesitate to embrace sustainable practices are often left behind by forward-thinking competitors who recognize the long-term cost savings of energy efficiency, waste reduction, and resource optimization.

Reality

According to McKinsey, companies that invest in energy-efficient measures can reduce their energy consumption by up to 30%, resulting in significant cost savings. The initial investment is quickly offset by the cumulative savings on utility bills.[3]

In addition, adopting circular models can extend product lifetime thus resulting in lower operating costs. Many medical equipment manufacturers offer system upgrade options or refurbishment programs that result in lower capital cost.

[3] *winssolutions.org/is-sustainability-really-too-expensive-find-out-now/*

Example
In 2018, U.S. healthcare provider Signature Healthcare launched a 10-year program to improve energy savings across seven sites in Bridgewater and Brockton, Massachusetts. The first phase of the project focused on improving infrastructure through facility improvements such as boiler and steam trap replacements, energy-efficient pumps, variable frequency drives, combined heat and power, building envelope, lighting and sensor upgrades, high-efficiency transformers, water conservation measures, and an operating room HVAC retrofit.

This resulted in more than US$380,000 in operational savings and more than US$470,000 in energy savings in the first year.[4] These energy efficiency measures are also significantly reducing Signature Healthcare's annual greenhouse gas (GHG) emissions, with estimated electricity savings of 22% and natural gas savings of 24%, reducing the network's CO_2 emissions by 3,400 tons annually. In addition, these upgrades will improve patient and staff comfort and help eliminate vulnerability to equipment downtime or failure.

On the opposite side of the world, South Africa's largest private healthcare company, Netcare, is already reaping the rewards of an early investment in sustainability. In 2015, the company began building a resilient network of hospitals with an eye toward the future. By 2023, Netcare's 72 solar photovoltaic plants, spread across its facilities nationwide, were generating roughly 10% their total energy needs.[5] This transition to renewable energy has already resulted in savings of approximately €1.8 million.[6] With this progress, Netcare is well on its way to meeting its ambitious goal of sourcing 100% of its purchased electricity from renewable sources by 2030, further cementing its commitment to both fiscal responsibility and environmental stewardship.

[4] *winssolutions.org/is-sustainability-really-too-expensive-find-out-now/*

[5] *siemens-healthineers.com/perspectives/zero-emissions-south-africa*
[6] *Netcare Limited ESG Report, 2023*

Myth 3: “Off” means unprepared.

In our Emergency Department, we never know what to expect. If we turn off imaging systems like CT, we could be unprepared for a crisis.

Hospital emergency departments must, as their name implies, be prepared to respond quickly and effectively to emergencies. Quick decisions and access to the right equipment is essential. With this in mind, energy-intensive equipment such as Computed Tomography (CT) units often remain on or idle in order to be ready for emergency cases that suddenly arrive.

Reality

Hospital equipment is a major contributor to healthcare’s overall climate footprint due to its many energy-intensive devices. And today’s technology does not need to remain on constantly in order to be used quickly. Even emergency patients usually arrive with prior notice. The hospital is informed by ambulance or helicopter, leaving ample time to start even the most sophisticated machinery, which takes only minutes, especially when idle. **Energy guides with precise information can be found here.**

In many cases, equipment remains in idle mode overnight and on weekends, to allow time for software updates or over concerns around cooling. During times like these, equipment continues to consume large amounts of energy. Hospitals can easily implement protocols on shut-down and start-up times to address this.

Example

Studies have shown that switching CT units from idle to off mode overnight could reduce power consumption by as much as 32%.[7] There are also other simple practices such as switching to Eco Power mode, which reduce power consumption while the system remains on.

[7] *aci.health.nsw.gov.au/ie/projects/ct-switch-for-savings*

Myth 4: Disposables are inevitable.

Hospitals need to prevent contamination and therefore cannot reduce the volume of waste consisting of single-use items.

Reality

Hospitals do deal with large amounts of hazardous waste and this must be treated with great care and in accordance with strict protocols. Nonetheless, they can prioritize and separate material designed for recycling. The uncomfortable reality is that the healthcare sector is a very significant producer of waste, a large portion of which consists of single-use plastics.

Plastic is highly effective at preventing cross-contamination. However, only a small fraction of this plastic is recycled. Much of it is incinerated – a major source of greenhouse gas (GHG) emissions.

Not all consumables are considered potentially harmful, and for consumables that do not come in contact with patient samples, material designed for recycling can be prioritized.

The incineration of one kilogram of medical waste can result in the emission of approximately three kilograms of carbon dioxide. It has been estimated that a single hospital bed is responsible for the production of more than 13 kilograms of waste per day, of which less than one kilogram is considered infectious waste.[8]

[8] *practicegreenhealth.org/topics/waste/waste-0*

Example
By leveraging innovative technologies and automation, waste can be dramatically decreased in laboratories by eliminating the need to divide samples into aliquots, usually held in plastic tubes. This approach also results in reduction of wastewater and improves turnaround time.

Dr. Lal Pathlabs, an Indian diagnostic service provider, achieved a 93% reduction in aliquot usage, saving over 1.3 million aliquots and eliminating 5.2 tons of plastic waste annually. By implementing advanced automation, analysers, and IT solutions, the lab also reduced CO_2 emissions by 21.5 tons per year. Additionally, the lab saved over €4.8 million in aliquot creation costs.

Hospitals can also collaborate with suppliers to embed sustainability into procurement, encouraging recyclable materials and circular product lifecycle management. Providers can procure products designed with less plastic or with alternative packaging materials that are more environmentally friendly.

Environmental impact per year:

–5.2 tons

Plastic waste reduced

–21.5 tons

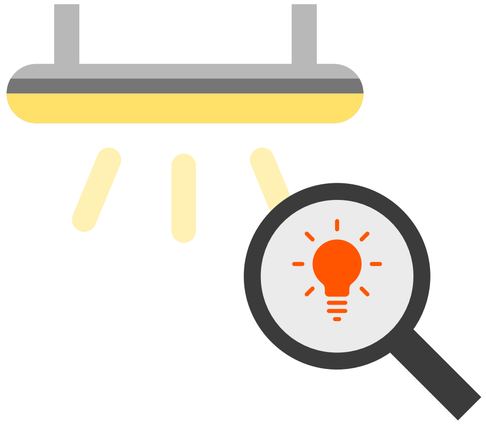
CO_2 emissions avoided

+$4.8M

Money saved

Myth 5: LEDs mean the job is done.

Switching to LED lights is the best way to save energy on lighting.



Reality

Switching to LED lighting is a highly effective way to reduce power consumption and energy costs; but this is not a substitute for additional, and more effective, next steps. In addition to switching to LEDs, upgrading to Smart LEDs can unlock further savings. The additional energy-saving features include:

- **Occupancy sensing:** Lights that are left on in unoccupied spaces, such as hospital rooms or lobbies, are a major source of wasted energy. Motion detectors in modern lighting systems address this issue by automatically switching off lights when no activity is detected. Other systems such as ventilation also have such capabilities.

- **Daylight harvesting:** Photo sensors can measure how much natural light enters a space and adjust artificial lighting accordingly. This ensures that rooms receive the right amount of lighting while minimizing unnecessary energy use.

- **Time scheduling:** Many healthcare properties operate 24/7, but some areas, particularly at night, run at reduced capacity. Smart lighting automation enables scheduled shutdowns of unnecessary fixtures during these periods, further reducing energy consumption.

Measures such as these make it easier for hospital staff to save energy, as lights are managed automatically, requiring minimal effort.

Example

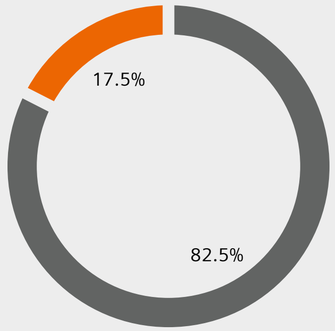
The savings from such measures can be substantial. The Mission Community Hospital in Panorama, California, used to spend US$2 million a year on lighting. After replacing its traditional fluorescent lighting with smart LEDs, the hospital expects to save US$350,000 annually. This will reduce their energy bills by US$1 million in less than three years.[9]

[9] *hfmmagazine.com/articles/4045-hospital-lights-the-way-to-savings*

Cost savings with smart LEDs

-17.5%

$1M in less than 3 years



Myth 6: “Pre-owned” means low quality.

Using refurbished equipment is more environmentally friendly, but the quality is inferior compared to new products.

This widely held belief is a vestige of an outdated view that equates “new” with “better.” For many, the allure of fresh, untouched products signals superior performance and longevity. When it comes to pre-owned items, especially those labeled “refurbished,” concerns about their history often cloud judgment. Do the refurbishment processes really lead to high quality? Is it truly as functional as its pristine counterpart? The assumption that pre-owned or refurbished goods are “outdated” or “damaged” persists, often leading to the belief that they are inferior. Yet this perception overlooks the quiet ubiquity of refurbished materials in our daily lives. The refurbished smartphone market is expected to more than double by 2032.[10] The automotive sector has seen similar trends: in countries like Germany, twice as many consumers prefer pre-owned cars over new models.[11] Despite this global shift, pre-owned medical equipment still accounts for less than 5% of the market.

[10] *credenceresearch.com/report/refurbished-smartphone-market*
[11] *allianzdirect.de/kfz-versicherung/trends-gebrauchtwagenmarkt*

Reality

The truth is that refurbished products – whether phones, cars, or medical devices – are often meticulously tested, and processes are certified to meet high standards. Leading brands run certified refurbishing programs, ensuring that these items not only meet rigorous quality checks but are also backed by warranties comparable to new products. These warranties provide buyers with peace of mind, alleviating concerns about potential defects or malfunctions.

Beyond the lower cost, purchasing refurbished goods carries significant environmental benefits. By reducing the demand for new resources, the strain on raw materials is reduced and waste is minimized. A refurbished CT scanner has up to 86% reduction of emissions coming from material use compared to a new model, saving as much as 24 tons of carbon in the process.[12] This isn't just a matter of cost-saving; it's a powerful testament to progress, innovation, and sustainability. In fact, most refurbished medical equipment is sold in industrialized countries. An estimated 70% of all refurbished imaging medical devices are sold in the U.S. (46%) and the European Union (24%).[13] Refurbished goods are not a compromise – they are a forward-thinking solution to the challenges of consumerism and environmental responsibility.

Example

Siemens Healthineers refurbished systems are built by the same teams in the same factories as all the new medical imaging products and offer the same warranty as a new system. The refurbishment follows externally certified processes, and the pre-owned systems and components undergo a rigorous five-step Quality Process. Satoshi Mizuno, Chief Radiology Technician at the Chiba Medical Center in Japan, insists that, after using refurbished systems for years, he cannot discern any difference in performance between refurbished and new equipment in day-to-day operation.

[12] *Based on the average of components re-used per returned CT SOMATOM Definition Edge eco system in 2022-2024. Whether components are actually refurbished versus harvested for parts or otherwise recycled is dependent on the state of the system.*

[13] *pmc.ncbi.nlm.nih.gov/articles/PMC10225950*

The path forward

The healthcare sector stands at a crossroads. The myths about renewable energy, financial constraints, and waste management are often not valid excuses for inaction. As these examples illustrate, integrating sustainability into healthcare systems is not only possible but financially beneficial. Hospitals can embrace renewable energy, reduce waste, and invest in smart technologies – without compromising patient care or service efficiency.

The examples highlighted in this paper make clear that sustainability and healthcare excellence are not opposing goals. Whether it's through energy-efficient technologies, smart microgrids, or waste reduction initiatives, healthcare organizations can build more resilient and cost-effective systems while significantly lowering their environmental footprint.

The path forward is clear: healthcare must overcome its hesitations and lead the way in sustainable practices. By dispelling myths and embracing innovation, the sector can improve not only the health of the patients it serves but that of the planet.

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With the unique combination of our strengths in patient twinning[1], precision therapy, as well as digital, data, and artificial intelligence (AI), we are well positioned to take on the greatest challenges in healthcare. We will continue to build on these strengths to help overcome the world's most threatening diseases, enable efficient operations, and expand access to care.

Our portfolio, spanning in vitro and in vivo diagnostics to image-guided therapy and cancer care, is crucial for clinical decision-making and treatment pathways. We are committed to improving healthcare access for all, limiting our environmental impact as we pioneer breakthroughs, and engaging our diverse Healthineers to achieve this impact on a global scale.

Motivated by our purpose and guided by our values, we are building an inclusive culture, where we embrace diversity in all its forms. We are a team of 73,000 Healthineers in over 70 countries passionately pushing the boundaries of what is possible in healthcare to help improve the lives of people around the world.

[1] *Personalization of diagnosis, therapy selection and monitoring, aftercare, and managing health.*

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