

COMMERCIAL PARTNER

CLEVELAND CLINIC FOUNDATION



Implementation Model:
Engaging Clinicians to Reduce
Resource Use in Operating
Rooms

ORGANIZATION TYPE

Healthcare

BARRIER

Lack of information and buy-in from clinicians
around resource conservation

SOLUTION

Education, targeted calls to action, supporting
data

OUTCOME

Resource awareness, engaged clinical staff;
measured energy, water reductions

Overview

Healthcare is a resource intensive industry, generating over 12 million pounds of waste every day. Across the U.S., healthcare facilities are among the most energy intensive commercial buildings, especially in-patient centers like hospitals. As the industry attempts to address the resulting environmental and human health impacts, the operating room (OR) is an area that Cleveland Clinic has targeted for its significant improvement potential. As a primary revenue source, supply user and waste generator among hospital units, the OR is a strategic priority for any hospital hoping to reduce its impact on the environment. “[Greening the OR](#)” initiatives have been undertaken across the industry with the potential to deliver substantial triple bottom line value.

Cleveland Clinic is transforming its model of care on many fronts. The organization seeks to respond to a market that will demand higher levels of quality at a lower cost. To address these changes Cleveland Clinic is improving the energy efficiency of its facilities and becoming less

resource intensive. By decreasing energy and water intensity, Cleveland Clinic is providing value for its patients and leading the industry in responsible healthcare practices.

Cleveland Clinic puts patients first. Linking energy and water programs to its core mission of patient care is the key to engaging clinicians and ultimately achieving energy and sustainability goals at Cleveland Clinic.

Cleveland Clinic Foundation's Playbook



Process

Cleveland Clinic's commitment to reduce environmental impacts, reduce costs, increase efficiency and improve patient and caregiver safety in the ORs required a well-structured program with a clear definition of roles, responsibility, and accountability at every level of the enterprise. A number of coordinated efforts have been implemented to enable caregiver participation and real savings:

Enterprise-wide Greening the OR Committee

In 2010, Cleveland Clinic endorsed Practice Greenhealth's Greening the OR Initiative to explore and demonstrate the OR's role in implementing sustainable strategies to address today's OR challenges across the sector. In 2013, Cleveland Clinic revitalized its commitment to the initiative by convening a cross-functional and enterprise-wide Greening the OR Committee to collaboratively and cost-effectively mitigate the intensity with which its ORs use resources. Led by the Office for a Healthy Environment, this group includes representation from Facilities, Buildings and Properties, Surgical Operations Administration, Nursing, Physicians, Clinical Engineering, Anesthesia, and Supply Chain. Convening key decision makers and influencers under a global umbrella, the Committee serves as an important connective tissue for projects and initiatives.

The Committee convenes monthly and provides a mechanism to identify opportunities, reduce costs and engage staff. The Committee dialogue addresses increasing efficiencies at the organization and ensuring that data driven best practices are reviewed and vetted through the appropriate channels. The Committee is also leading the effort to embed sustainability requirements into revised OR construction standards.

Energy Initiatives in the OR

ORs have the highest requirements for air changes per hour, require strict temperature parameters and use energy-intensive (and often heat-generating) surgical lighting systems. Cleveland Clinic hired an engineering firm to conduct extensive engineering reviews to prioritize energy-efficiency efforts in existing ORs. Some of the piloted improvements include:

Surgical lighting was standardized to LED in 2010, replacing halogen lighting in OR upgrades. To further reduce the energy intensity of the ORs, Cleveland Clinic has also targeted pattern lighting around the surgical field for upgrades from halogens to LEDs. Since LED lights release less energy as heat, the illuminated OR remains cooler which reduces the demand on the HVAC system during occupied periods. This upgrade is expected to yield a 54% reduction in energy usage. Further, the installation of occupancy sensors will ensure that ORs are not illuminated when empty. HVAC Set-backs: Operating under the general philosophy that more is better, many of Cleveland Clinic's operating rooms were set to

provide far more fresh air than required by code. The pilot will explore an enterprise-wide rollout of new air exchange and setback standards, reducing air exchanges in occupied ORs to the ASHRAE Standard of 20 air exchanges per hour, with unoccupied set-backs to 4 exchanges per hour. Cleveland Clinic's Energy Team is working with clinicians to alleviate concerns about surgery safety and readiness by installing occupancy sensors, which begin conditioning the space as the first caregivers enter to prepare for surgery. If these pilots are successful, the strategies will be also be included in updated Construction Standards for new and renovated ORs.

Water Initiatives in the OR

The amount of water used during surgical scrubbing in ORs is significant. To better understand water usage at Cleveland Clinic, physicians, supported by a Greening the OR fellowship (see below), conducted water audits during surgical scrubbing by metering water use at the sinks. Once a baseline was established, the physicians initiated targeted water conservation education regarding dry scrub techniques and their safety and efficacy. The physicians are now collecting water use data to determine the water reduction percentages and intend to publish their findings in a peer reviewed journal.

Waste Initiatives in the OR

The Operating Room generates intense volumes of waste, many of which can be recycled or recaptured for reuse. Cleveland Clinic's successful clinical plastics recycling program captures pre-incision clinical plastics for recycling through an innovative community partnership with a vocational services program for individuals with disabilities. Cleveland Clinic currently collects 3 tons of clinical plastics from the Main Campus each month. Since late 2013, an active expansion of the program across the health system is underway. Vented anesthetics negatively impact air quality. Cleveland Clinic is piloting new technology to capture and reuse waste anesthetic gases. Designs have been completed and construction is underway for a centralized anesthesia gas recapture system in targeted ORs.

Physician Energy Champion

Cleveland Clinic is a physician-led organization, where physicians provide leadership to advance material issues. Daniel Alam, MD was named by the executive level leadership to serve as the Physician Energy Champion for Cleveland Clinic. As the Physician Energy Champion, Dr. Alam lends a physician perspective to strategic energy dialogue and vets energy programs amongst physicians and executive clinical leadership. Dr. Alam also represents physician leadership on the Greening the OR Committee.

Greening the OR Fellowship

Cleveland Clinic has also funded a legacy fellowship program to support the advancement of resident education and sustainability in the OR. The fellowship was named for Ken Lee, MD, a gifted surgeon and teacher who was committed to training new physicians and promoting the creation of healing environments of the future. The fellowship funds research in OR sustainability and a sustainability lecture series. Dr. Sofya Asfaw, a general surgery resident, is the first Greening the OR Fellow. Dr. Asfaw is involved in the surgical scrubbing water conservation research noted above, which is partially funded by the fellowship. With the support of the Graduate Medical Education department, she has also convened a Greening the OR Committee for interested residents and fellows at Cleveland Clinic to further engage these newer physicians in the hospital's sustainability efforts.



Outreach

Cleveland Clinic employs a number of internal and external outreach strategies for the Greening the OR initiative. Internal efforts include:

- The “I am Sustainable Healthcare” messaging campaign with key program statistics, logos, personal profiles and program collateral.
- Greening the OR presentations by the Physician Energy Champion to the CCF Graduate Medical House Staff Association Committee in November 2013. This organization of over 1,000 members represents a rare opportunity to bring the energy program to the attention of clinicians. Presentations focused on the efforts of physicians and colleagues are especially impactful.

External outreach efforts include presentations on the initiative at major conferences, including the Greening the OR Symposium and CleanMed 2014.



Tools and Resources

- [The Business Case for Greening the OR, Practice Greenhealth](#)
- [Greening the OR Checklist, Practice Greenhealth](#)
- [“I am Sustainable Healthcare” campaign sample collateral](#)
- [Cleveland Clinic Energy Management Standards Manual](#)
- [Effect of surgical site infection with waterless and traditional hand scrubbing protocols on bacterial growth¹](#).



Outcomes

Cleveland Clinic has achieved 5% portfolio-wide energy savings toward its 20% goal. Actual energy and water savings from Greening the OR pilot projects currently in progress will be posted when available.



Measuring Success

Cleveland Clinic set a 2013 annual Energy Use Intensity (EUI) reduction target of 3.1%. The hospital system uses weather normalized source EUI as the sole tool to evaluate progress toward its commitment of 20% energy use reduction by 2020. ENERGY STAR Portfolio Manager is used to evaluate individual facility performance and benchmark against similar facilities. Cleveland Clinic

¹ Chia-Feng Chen RN, Chih-Lu Han PhD, Chiou-Ping Kan RN, Shyi-Gen Chen MD, Ping Wei Hung (2012). Effect of surgical site infection with waterless and traditional hand scrubbing protocols on bacterial growth. *American Journal of Infection Control*. 40, e15-e17

provides reports exported from Portfolio Manager as its source data to report energy performance, along with other key environmental metrics, through a single internal process.

Cleveland Clinic has tremendous opportunities to design efficiency innovations in the same way it has innovated in medical care and quality. Physician leaders and teams of individuals across the enterprise are working hard to evaluate clinical and administrative areas and identify how services and processes can be improved to add value and reduce costs, including specific work groups to tackle energy efficiencies. The goal remains to provide the highest quality care to patients in the most efficient and cost effective manner to provide affordable world class care.