



Let's Recycle Better, Together.

ADVANCING THE
CIRCULAR ECONOMY
IN HEALTHCARE

WEDNESDAY JANUARY 24TH
1:00 PM ET.



Today's Panelists



Erika Kimball, RN
CEO & Principal
Kimball Sustainable
Healthcare



**Sarah Brockhaus
Kucinskas**
*Sustainability Programs
Manager*
UCLA Health



Victor Mitry
*Assist. Director,
Logistics & Materials
Management*
UCLA Health



Lauren Koch
*Sustainability Program
Manager*
The Ohio State University
Wexner Medical Center

Join the Discussion

From your toolbar:



Share your experience
& opinions

Look for links
to resources

Type direct questions
for panelists

Erika Kimball, RN
CEO & Principal



ks Kimball Sustainable Healthcare

Building the Healthcare Circular Economy

Reuse and Reprocessing in the Clinical Setting



Kimball Sustainable Healthcare

we build sustainability solutions for hospitals and healthcare

Strategy

Assessments, Strategic Planning,
Data and Metrics

Program Development

Implementation, Process Design,
Standards and Policy

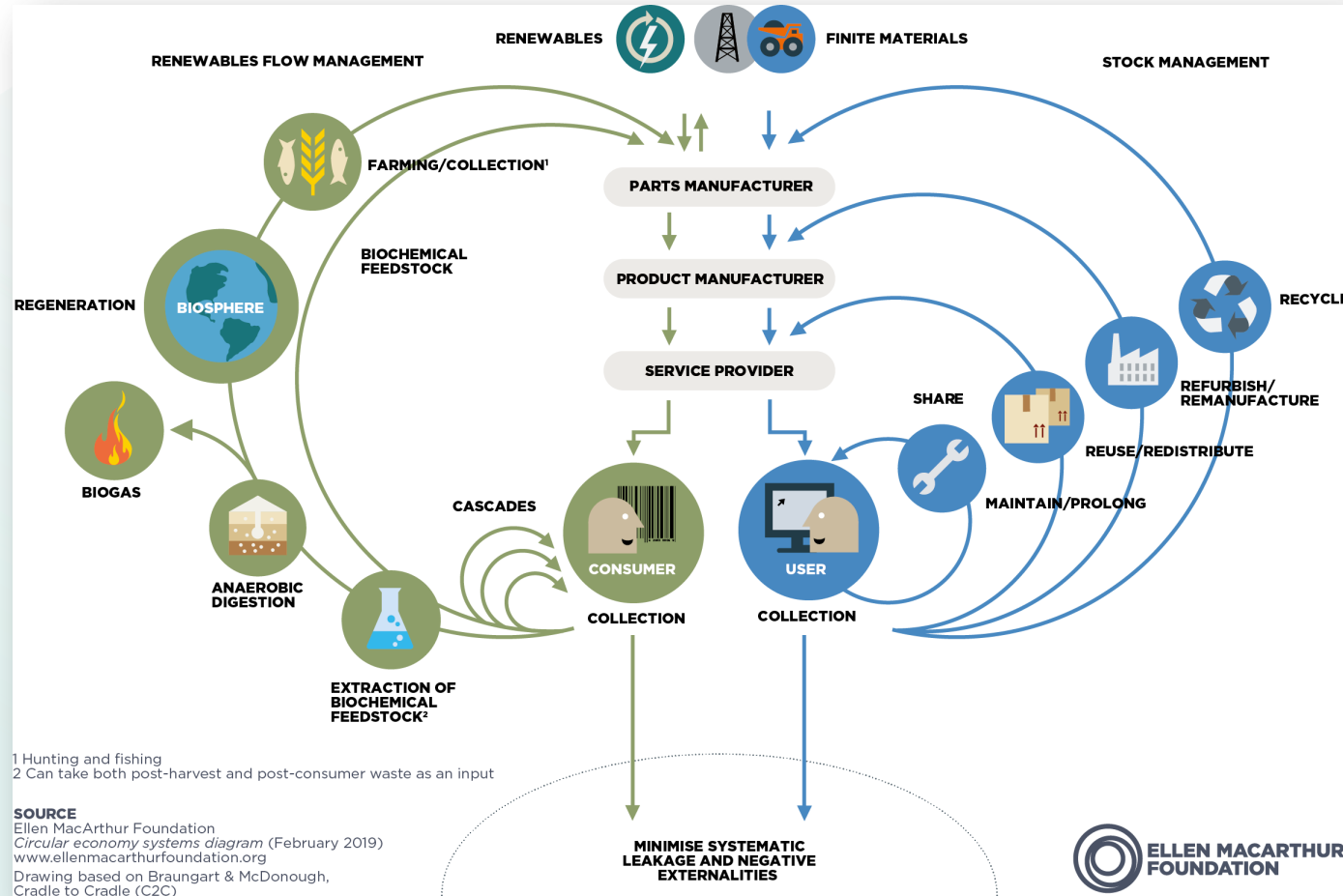
Communications and Engagement

Education and Outreach, Reporting,
Content and Publications



Building the Circular Healthcare Economy

Applying zero waste + healthcare quality best practices to eliminate waste



Source: Ellen MacArthur Foundation



Benefits of circularity

Build healthcare value, quality, and community wellbeing



Decarbonize healthcare

- Waste prevention is the first step in decarbonization
- Maximizing the useful lifecycle of products and inputs drives down carbon emissions



Save money

- Reduced per/use purchase cost
- Reduced operational costs
- Reduced administrative costs



Create local jobs

- Remanufacturing creates ~ 30x jobs compared with landfills*
- Repair creates > 200x jobs compared with landfills*



Build resilience

- Reuse and reprocessing localizes your supply chain
- Reduces the total demand for new products and parts

Unpacking the hospital waste bin

By the numbers

5.9 million tons of waste per year in U.S.

30 lbs. per patient day

30% generated in O.R.s

Majority of waste generated in clinical areas

Types of waste generated in clinical areas:

- Single-use disposable supplies and linens
- Unused unopened supplies
- Clinical product packaging
- PPE
- Other general municipal waste



Circular economy principles for healthcare

Achieving the highest, best use for materials at each stage of product lifecycle

Success factors:

- Make and source products that create value for their full lifecycle
- Maintain those products and materials through care and quality processes
- Establish policies and standards to support the successful growth of circular supplies and services

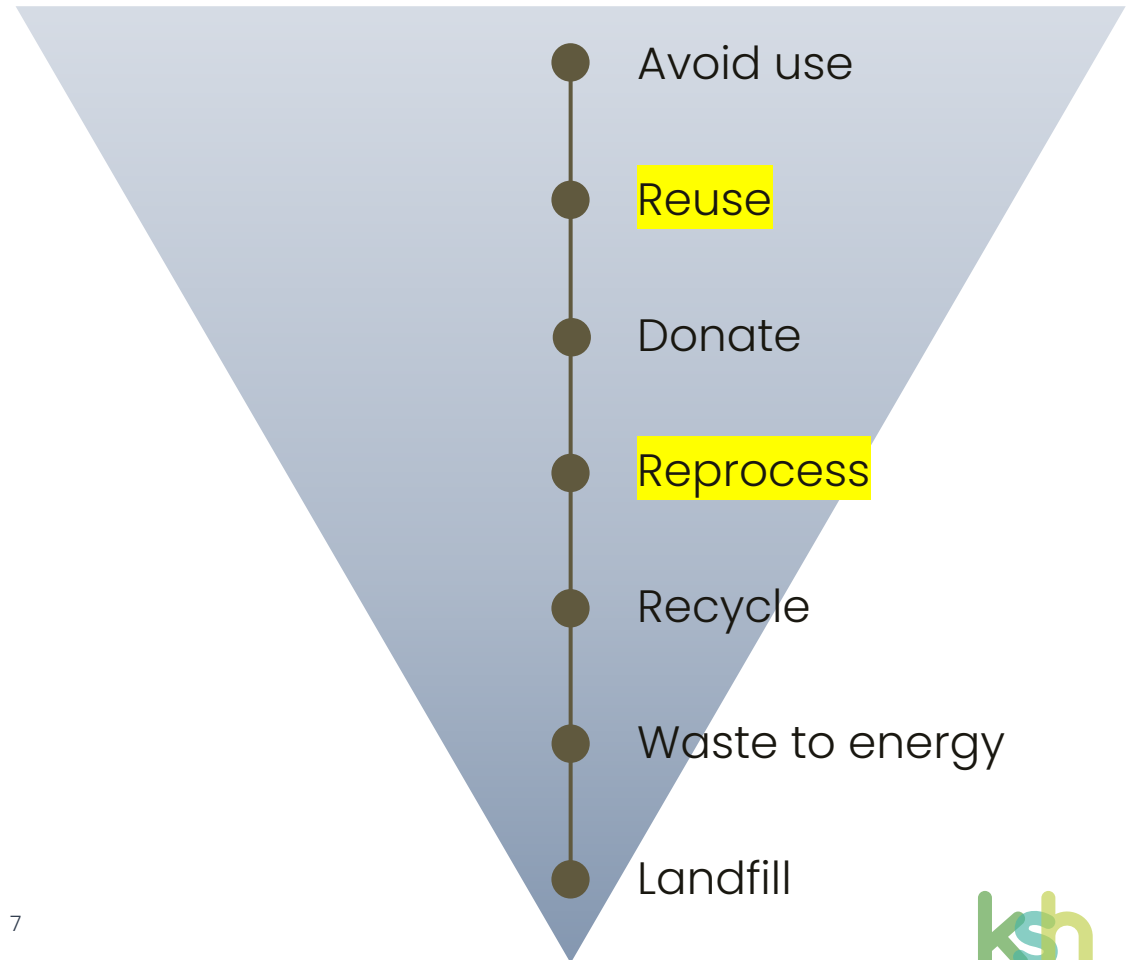


Circular economy principles for healthcare

Achieving the highest, best use for materials at each stage of a product's lifecycle

Success factors:

- Make and source products that create value for their full lifecycle
- Maintain those products and materials through care and quality processes
- Establish policies and standards to support the successful growth of circular supplies and services



Reusable healthcare products

Use, cleaning, care and maintenance of durable supplies

- Common reusable product categories
 - Food service ware
 - Launderable surgical linens
 - PPE – isolation gowns
 - Patient positioners
- May be cleaned or sterilized internally, or processed by external vendor
- Product lifecycle averages 70 – 200+ uses depending on products



Reprocessed medical supplies

Third party remanufacturing of single-use disposable devices (SUDs)

- SUDs are collected, processed, cleaned, tested, and repackaged for reuse by healthcare providers*
- Reprocessed devices include:
 - Invasive medical devices (surgical tools)
 - Non-invasive medical devices
- Two opportunities to reduce cost and environmental impact
 - Collect reprocessable devices
 - Purchase reprocessed devices



Non-invasive device



Invasive device



Success Factors for Reuse and Reprocessing

Using the healthcare quality improvement model to reduce waste

1. Build and engage the full team

Circular healthcare initiatives are a multi-disciplinary project

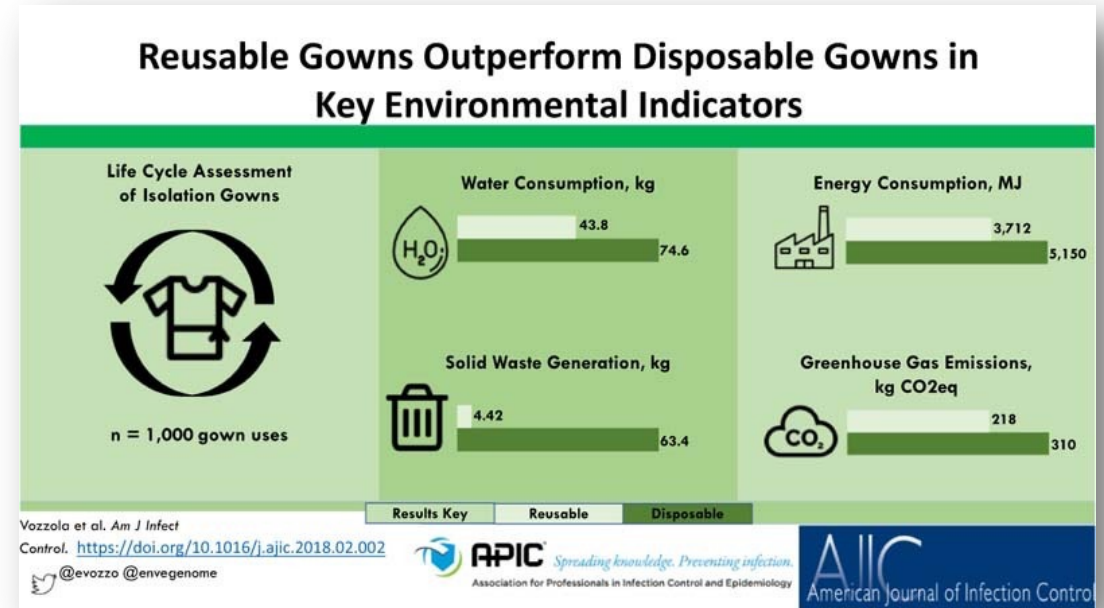
- Clinicians
- Clinical Support Staff
- Environmental Services
- Infection Prevention
- Quality and Safety
- Supply Chain
- Sustainability



2. Make the case

Use a data driven approach

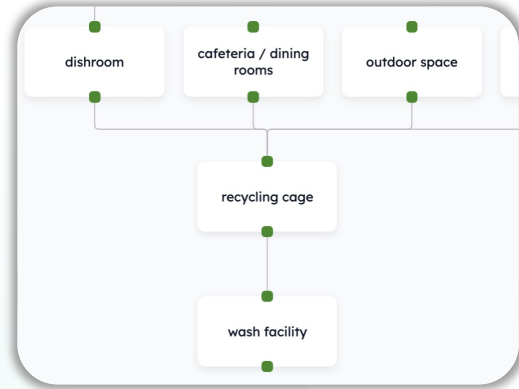
- Evaluate and compare for a circular vs. a conventional product
 - Total number of products used
 - Total product lifecycle
- Make the business case
 - Total lifecycle cost
- Make the environmental case
 - Waste, CO₂e, Water
- Make the clinical case
 - Quality, safety, infection prevention



E. Vozzola et al. / American Journal of Infection Control 46 (2018) 881-6

3. Make a quality plan

Using zero waste best practices



Set-up

- Right-size bin, in the right location
- Clear, simple, standard signage

Process

- Plan and map: from point of generation to final processing
- Clarify roles and responsibilities, schedules, escalation pathway

Education

- All product users, departmental support staff, vendors
- Educate on the 'why' as well as on process and quality

Continuity

- Audit & Feedback: sort quality, service operations
- Track outcomes: cost and enviro. savings

Toward Healthcare's Circular Future

Better products

Better processes

Healthier communities



Sarah Brockhaus Kucinkas,
JD, MBA, LEED Green Assoc.
Sustainability Programs Manager



Victor Mitry, CMRP
*Assistant Director, Logistics &
Materials Management*



Prioritizing Reduction, Reuse, & Reprocessing at UCLA Health

**Sarah Brockhaus Kucinkas, JD/MBA, LEED Green Associate
Sustainability Programs Manager**

**Victor Mitry, CMRP Assistant Director
Logistics / Materials Management**

Our Annual Impact

3.6
MILLION
OUTPATIENT
CLINIC VISITS



787,100

Unique Patient Visits

79,500

Emergency Department Visits

38,500

Inpatient Hospitalizations

FOUR HOSPITALS

- Ronald Reagan UCLA Medical Center
- UCLA Mattel Children's Hospital
- Stewart and Lynda Resnick Neuropsychiatric Hospital at UCLA
- UCLA Santa Monica Medical Center

MORE THAN 270 CLINICS

offering primary and specialty care services throughout Southern California and the Central Coast.

We enhance access by providing care at

- California Rehabilitation Institute
- 12 immediate care locations
- Homeless Healthcare Collaborative mobile vans
- Numerous affiliate sites and community-based programs including Venice Family Clinic, Harbor-UCLA Medical Center and others



Our People

34,600

Employees

3,500

Clinical Faculty

5,100

Registered Nurses

1,460

Medical Residents and Fellows

848

Medical Students

411

Doctoral Students

The Healthcare sector is responsible for around 8.5% of total U.S. greenhouse gas emissions.

Hospitals in the U.S. produce an average of 5.9 million tons of waste each year.

Greenhouse gas emissions, waste pollutants, and environmental harms *all contribute to adverse health impacts of patient populations and disproportionately impact marginalized communities.*

**Prioritizes waste reduction in the following order:
reduce, reuse, *and then* recycle**

Reduce unnecessary purchasing first,
then prioritize the purchase of surplus or multiple-use products,
before looking at recyclable or compostable products.

**Prioritize reprocessing by implementing new collections and
requiring reprocessing in contracts**

**target of 25lbs of total solid waste / adjusted patient day by 2025
strive for 20lbs of total waste / adjusted patient day by 2030**

Solid waste includes municipal solid waste + all forms of regulated waste

- **Different types**
- **Paper or pulp for low repellency**
- **Spun polyester for medium repellency**
- **Can also be treated with a Laminate or plastic film to be fluid resistant**
- **Single use**
- **Cheap to manufacture**
- **Not durable-more susceptible to snags & rips**
- **Each gown creates solid waste**
- **No recycling or reprocessing program existed**
- **UCLA Health purchased 2.6 M disposable gowns annually prior to transition to reusable and sent 234 tons to landfill**



Vendors presented their selection of isolation gowns and feedback on best practices

Compared products specs, benefits and cost
AAMI standards for barrier protection (1-4)

Sub-committee formed to evaluate products

Stakeholders
Infection Prevention, Nursing Leadership, Caregivers, Sustainability, Environmental Services, Laundry Processing Plant, Materials Management

Evaluated delivery method, space requirement, folding, bundling, washing/drying requirements, and overall cost

Established a pilot in areas of high-utilization to evaluate process flow and caregiver feedback

Trial Units: Liver Transplant, Peds, Med Surg, ICUs

Initial Feedback/Response

Criticism

- “Disposables are easier to remove”
- “Washables are slippery”
- “Washables are too hot”

Acceptance and Support

Teamwork and Buy-In

- Sustainability
- Nursing
- Infection prevention
- Cost savings for senior leadership

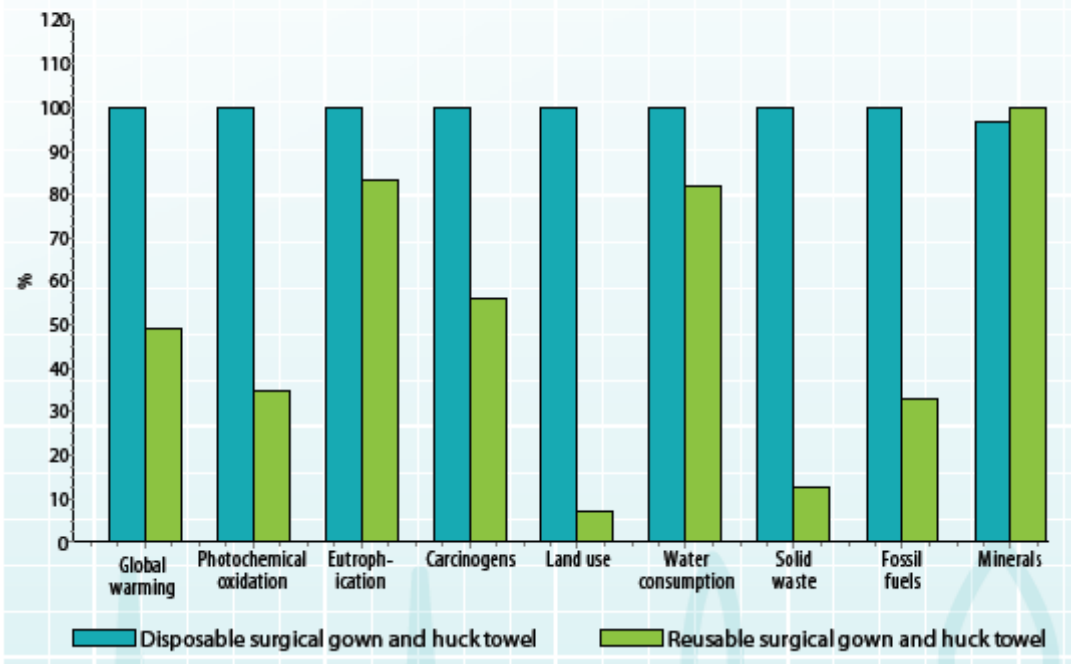


HLAC Accreditation & Hygienically Clean Healthcare Certification

Partnership with Local Laundry Processing Plant

- **Gowns at End of Life**
 - Current linen is never thrown out, utilize a recycler
 - Linen is often donated to different organizations and countries
 - Evaluating other uses in partnership with vendors, such as upcycled bags

Figure 1: Comparison of life cycle factors of disposable textiles compared with reusable textiles.⁹

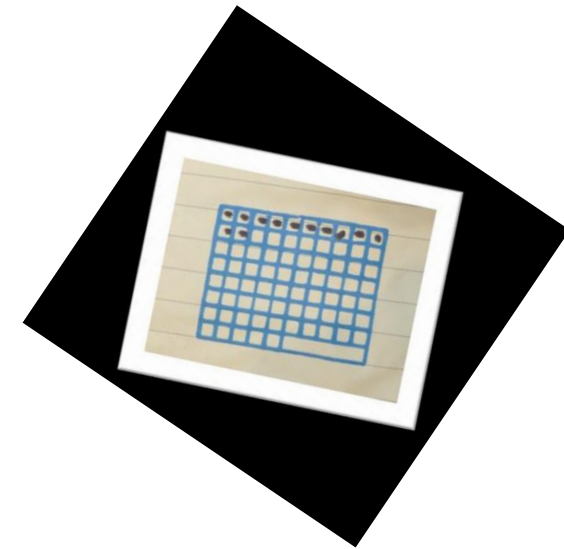


Studies on Reusable Textiles (Surgical Gowns)*

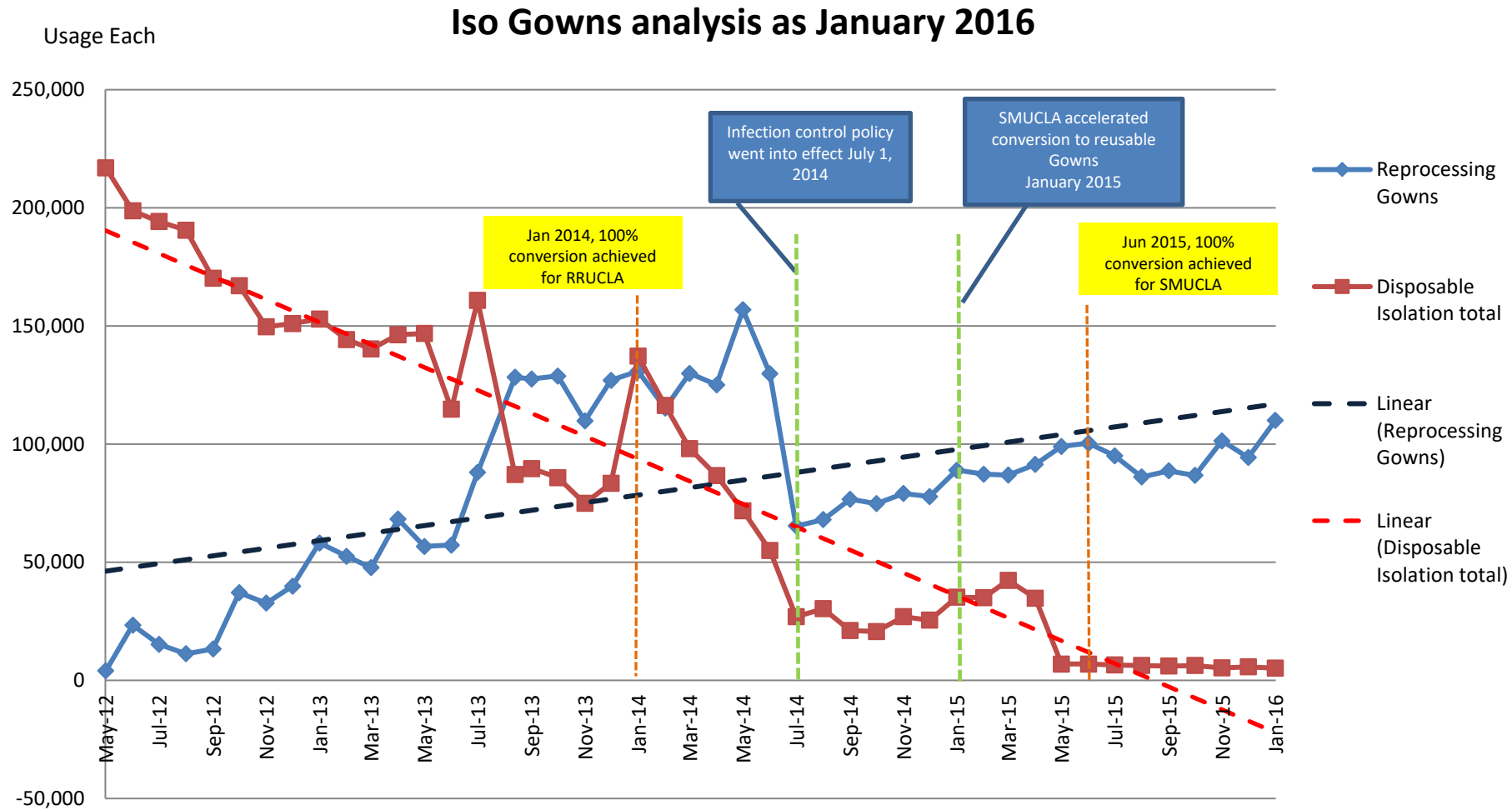
- **Six studies concluded reusable gowns are less of an environmental burden than disposable gowns**
- **According to these studies, disposable gowns consume more than reusable gowns in all areas of sustainability**
 - **200-300% more energy**
 - **250-330% more water**
 - **200-300% higher carbon footprint**

* A Comparison of Reusable and Disposable Perioperative Textiles: Sustainability State-of-the-Art 2012; Michael Overcash, PhD

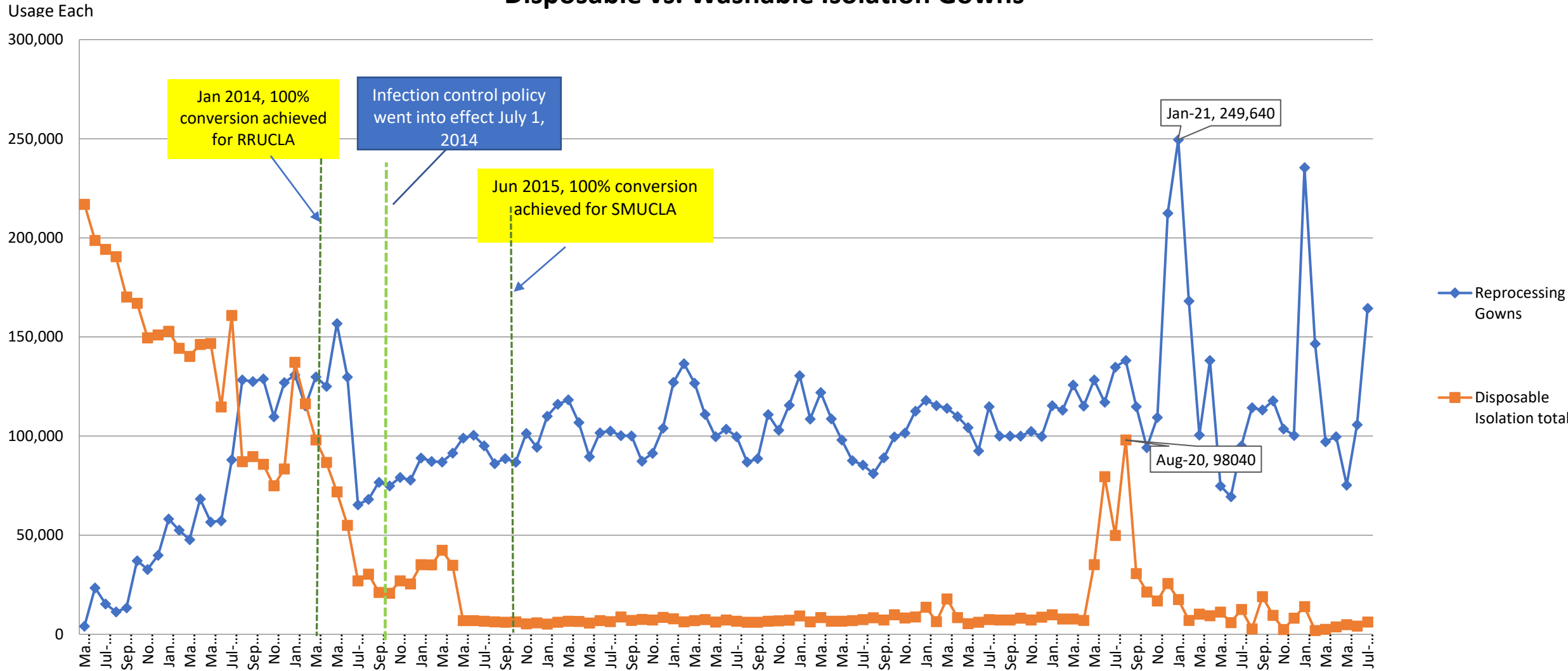
- **Manufactured from a 99% tightly woven micro-denier polyester fluid resistant fabric**
- **1 % Carbon fibers added to help prevent static electricity that builds up in polyester materials**
- **One size fits all and a 3X size option**
- **Shorter cuffs for increased protection and to allow for double gloves (under the cuff and over the cuff)**
- **Snaps (no ties) to make the gowns easy to take off quickly**
- **Reversible gown, no right or wrong way to put them on**
- **Grid on the bottom of the gown to mark number of uses**
- **Average Cost \$7 to \$10 depending on size**



Implementation Analysis (May 2012 to May 2015)



Disposable vs. Washable Isolation Gowns



Significant Environmental Benefits and Cost Savings

- Issued over 14 million washable isolation gowns since May 2012
 - 14 million+ single-use gowns diverted from landfill
- Conversion reduced gowns from 2.6 to 1.3 million gowns annually (50% reduction)
 - 1.3 million excess gowns not purchased, 2.6 million not sent to landfilled
- Conversion reduced gown cost from \$1.6 million annually to \$500,000 for reusable.
 - \$1.1 million initial savings from rollout of program May 2012 to May 2015 and 2014 IP update removal of MRSE & VRE from standard precaution protocols*
- Total Cumulative Savings of Program: Over \$4 million
 - Average annual savings \$450,000

 **Resiliency**

**IP standard precaution protocols for MRSE (Methicillin-resistant Staphylococcus Aureus) and VRE (Vancomycin Resistant Enterococci)*

REUSABLE ISOLATION GOWNS



Costs **50% less** than disposables

Customized to caregivers' needs

Meets industry standards for **infection protection**

Ensured **uninterrupted** protection to health workers during COVID-19

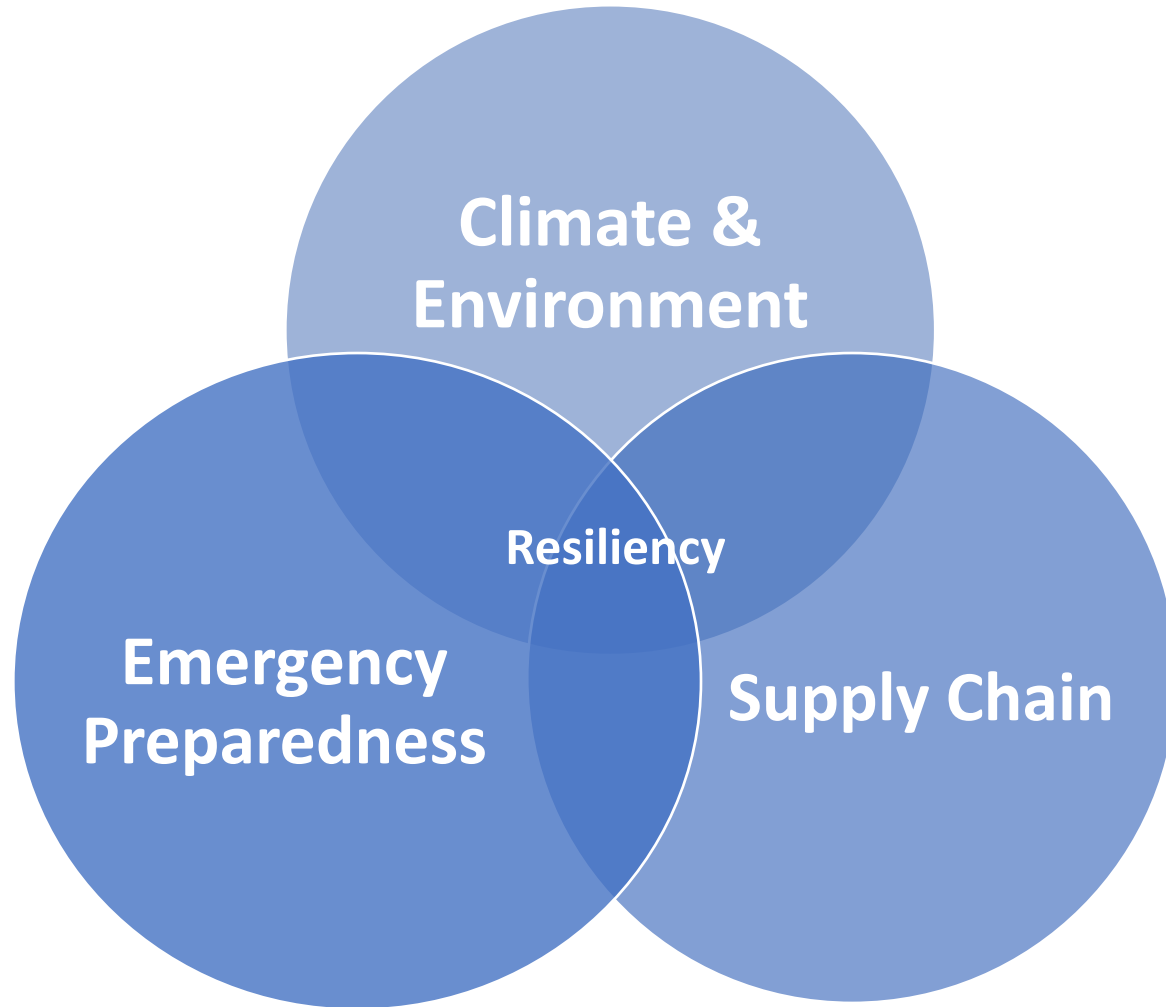
Lasts **75-100** washes

28% less energy
30% less GHGs
41% less water
93% less waste (for one facility)

Cost savings averaging **\$450,000** per year

An affordable, reliable, and sustainable solution for health care.

Source - Health Care Without Harm and Practice Greenhealth



The COVID-19 Pandemic highlighted supply chain vulnerabilities, and the interconnection between climate, preparedness planning, and supply chain resiliency.

The reusable ISO gowns initiative allowed UCLA Health to avoid supply shortages of this critical PPE item during the COVID-19 pandemic.

Other reusability initiatives were implemented during that period, such as UV light sterilization of PPE.

UCLA Health

Live Poll #1

What practices are you seeing gain traction at facility(ies) you work with? *(check all that apply)*

- OR kit reformulation
- Single use device reprocessing
- Reusable medical products *(PPE, surgical linens, etc.)*
- Reusable foodservice containers
- Other reuse/ waste prevention efforts *(share in chat)*

Lauren Koch, MENR
Sustainability Program Manager



THE OHIO STATE UNIVERSITY

WEXNER MEDICAL CENTER



OSUWMC Case Study: Medical Device Reprocessing

Lauren Koch, MA, MENR
Sustainability Program Manager

1.24.24



We are central Ohio's only academic medical center

7

hospitals

1,506

beds

9

multispecialty
centers

NCI

designated
comprehensive
cancer center

100+

facilities



Wexner Medical Center (WMC) Strategic Plan Pillars



Talent and Culture



Research



Education



**World Class
Care**



**Operational
Excellence**



Health Equity

SUSTAINABILITY



Resource Stewardship Goals

University Fleet's Carbon Footprint

Reduce carbon footprint of university fleet per thousand miles traveled by 25% by 2025



Carbon Neutrality

Achieve carbon neutrality by 2050 per Presidents' Climate Leadership Commitment



Locally Sourced Food

Increase production and purchase of locally and sustainably sourced food to 40% by 2025



Ecosystem Services

Increase Ecosystem Services Index score to 85% by 2025



Potable Water Consumption

Reduce potable water consumption by 10% per capita every 5 years – reset every 5 years



Zero Waste

Achieve Zero Waste by 2025 by diverting 90% of waste away from landfills



Building Energy Consumption

Increase the energy efficiency of the university by 25% per building sq. ft. by 2025



Preferred Products

Develop and Implement standards by 2025

FY23 Sustainability Results

4.5%
less energy use
than FY22



65%
Decrease in anesthetic
gas emissions from 2018
baseline



900
Green Team members,
an increase of 15%



9,200 pounds
of medical devices
reprocessed and
\$1 million in savings



Telehealth avoided
emissions of **1100**
cars for a year

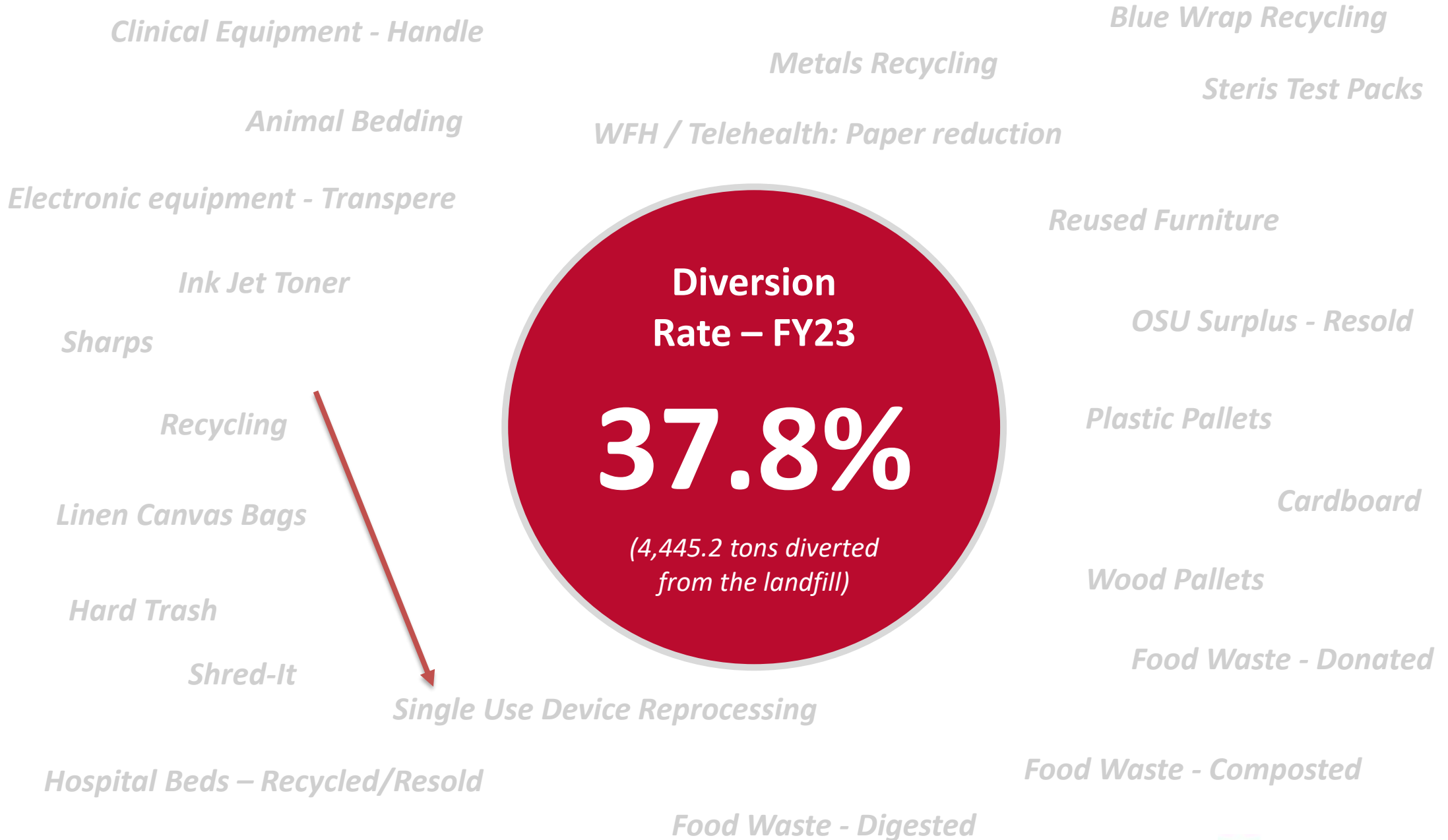


38%
diversion of waste



32.4%
carbon neutral electricity





Sustainable Procurement Strategy

The Ohio State University

Administrative Guideline/Procedure

Sustainable Procurement Guideline (SPG)

PURPOSE:

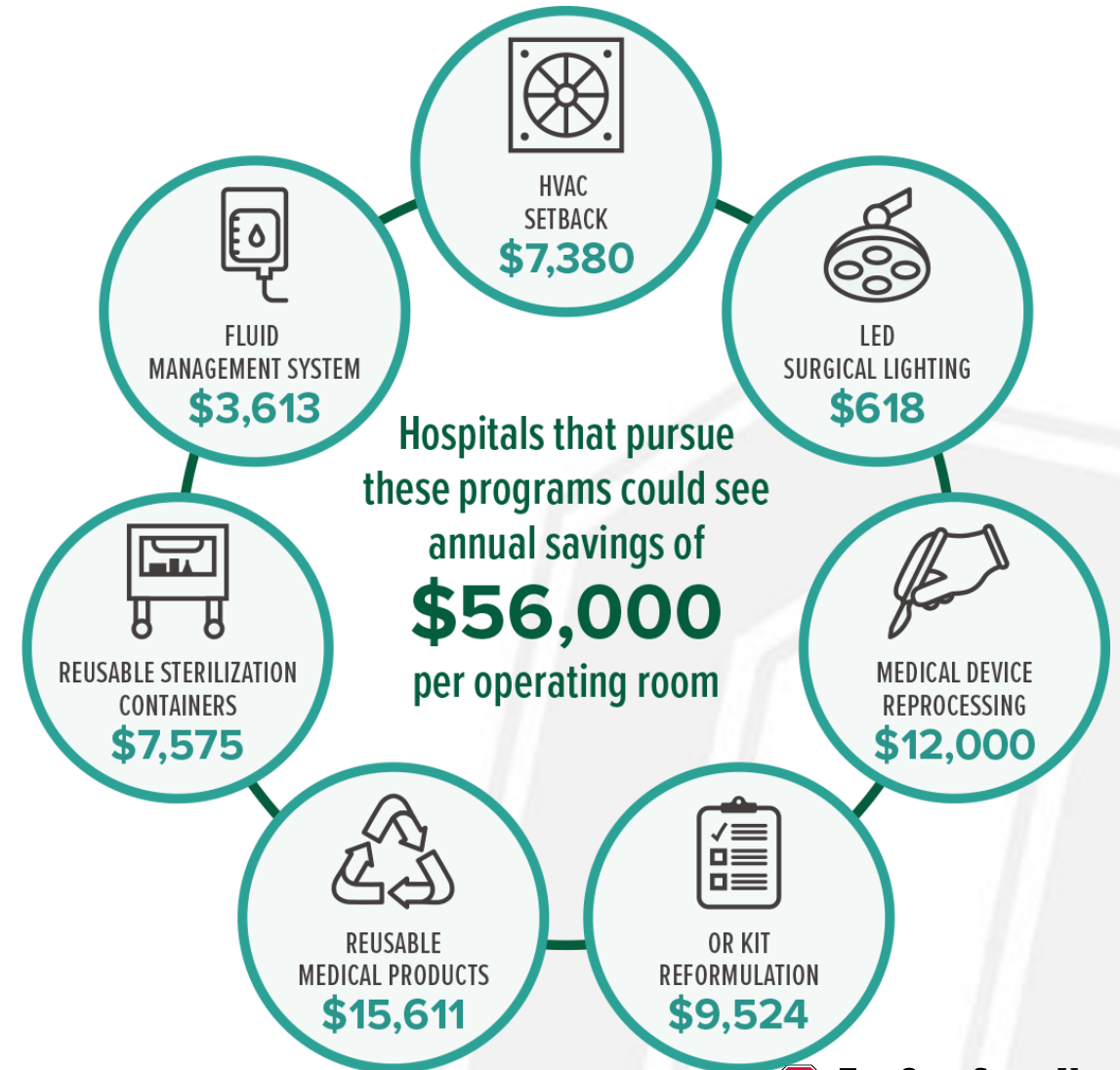
The Ohio State University is committed to Sustainable Procurement in support of Ohio State's Sustainability goals focused on improving the student experience on campus, the health of our patients and families, staff, and the communities we serve through innovation in research, education, and patient care.

GUIDELINE:

This Sustainable Procurement Guideline (SPG) will be applied to procurement decisions made by Strategic Purchasing and Supply Chain, excluding pharmaceuticals. Ohio State will evaluate the social, economic and environmental impacts of products, services and processes in an effort to minimize adverse impacts and select healthy and safe products and services. Ohio State's staff involved with product selection will communicate to the marketplace that the university expects suppliers to continuously develop price competitive products that conform to our SPG.

GENERAL GUIDELINES:

- I. SPG will be incorporated into the deliberations on commonly used products, especially where sustainable alternatives may be available.
- II. Sustainable Procurement criteria identified below will not be the sole criteria for decision-making. Additional factors used for determining product selection include clinical outcomes, infection prevention, safety for patients and staff, cost and other quality and service components.
- III. Products, services, and processes will be evaluated in RFP scorecards using the Sustainable Procurement criteria.



[Link: Sustainable Procurement Guidelines](#)

Not a new idea, but still has room for improvement

OR GREENING THE OR

PRACTICE GREENHEALTH 2023 SUSTAINABILITY BENCHMARK DATA

MEDICAL DEVICE REPROCESSING	ALL	SMALL	LARGE	TOP 25	GOR CIRCLE
Implemented a medical device reprocessing program with an FDA-approved third party reprocessor	82%	79%	85%	80%	100%

MEDICAL DEVICE REPROCESSING AGGREGATE DATA	TOTAL
Total weight of devices collected (lbs.)	1,608,467
Total weight of devices collected (tons)	804
Total avoided waste disposal costs	\$485,664
Total dollars spent on purchase of reprocessed devices	\$61,079,806
Total dollars saved annually through medical device reprocessing purchasing program	\$50,496,054
Total dollars saved through SUD reprocessing including both avoided waste disposal costs and reduced purchasing cost	\$50,981,718

MEDICAL DEVICE REPROCESSING MEDIANS	ALL
Pounds of reprocessed devices collected per OR procedure (lbs.)	0.43
Pounds of reprocessed devices collected per OR (lbs.)	250.10

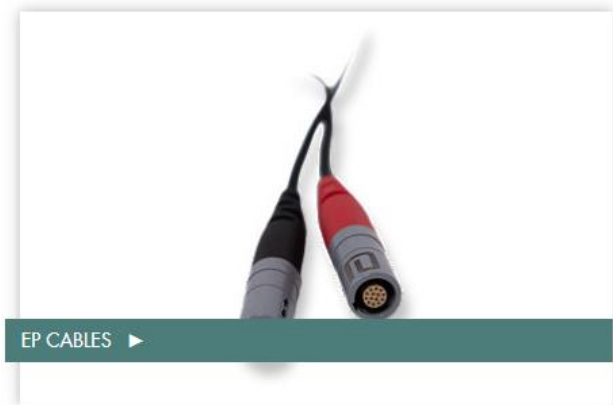
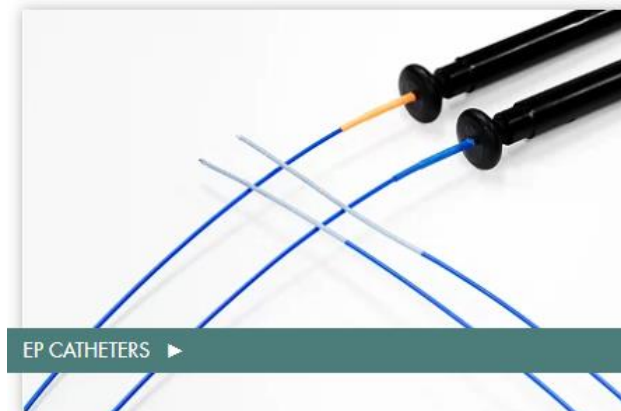
ANNUAL COST-SAVINGS FROM MEDICAL DEVICE REPROCESSING	PER FACILITY	PER OR
Median cost-savings from medical device reprocessing program	\$97,035	\$7,399
Median cost-savings from avoided waste disposal costs from devices collected for reprocessing	\$1,275	\$82
Median cost-savings on reprocessed devices from both purchasing reprocessed devices and avoided waste disposal	\$88,743	\$6,319

Source: Practice Greenhealth 2023 Benchmark Data Report

SUD Reprocessing Program Overview

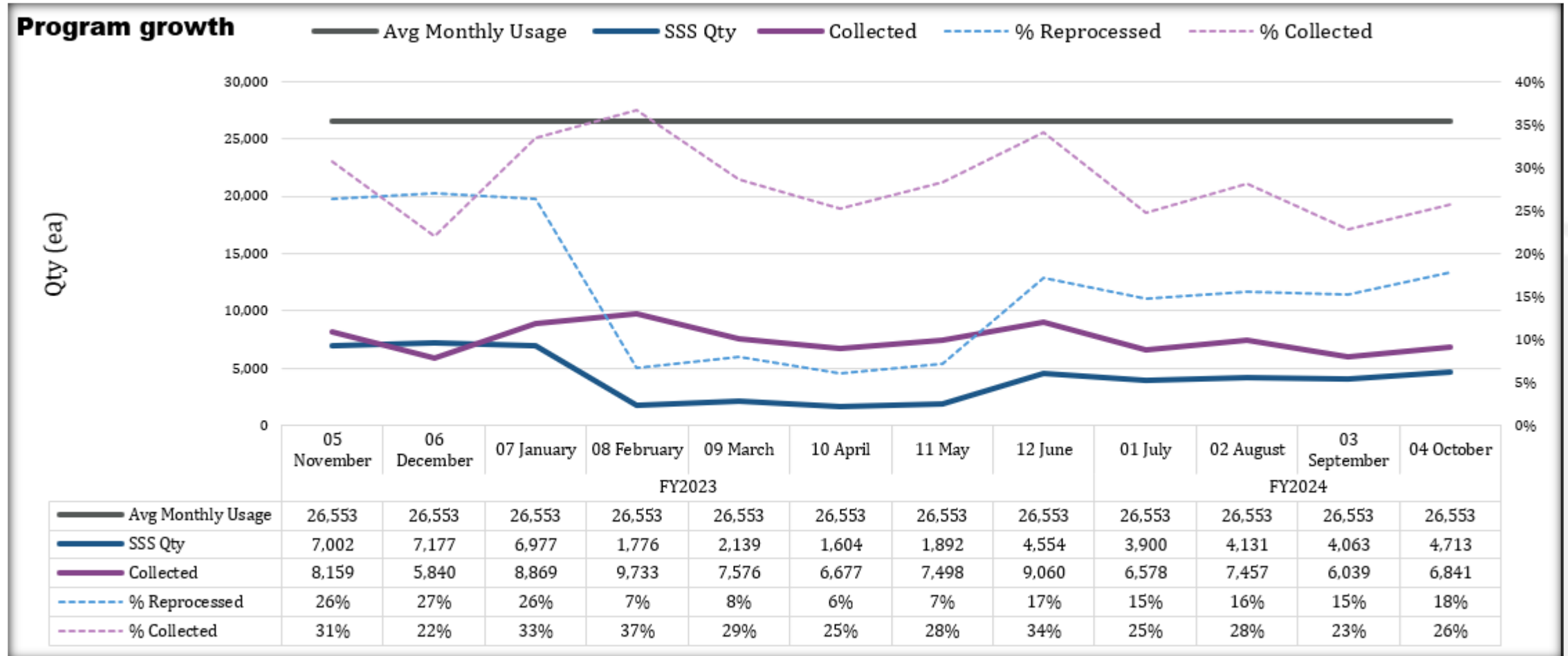
- Driven through supply chain as a cost savings initiative
- Primary partner is Stryker Sustainable Solutions
- Vendor provides monthly business reviews and an onsite presence for collections

What we buy back reprocessed



Over \$1 million in savings annual

Program growth - collections



Barriers

Why have we still not optimized?



01

System updates

02

Staff turnover

03

Lack of vocal clinical support

04

Vendor misinformation

05

Contract timelines / handcuffs

Results

Stryker's Sustainability Solutions

stryker



12.3M

2011-2023

Total Spend

Waste
diversion



265K

2011-2023

Annual lbs. Diverted



837K

2011-2023

Reprocessed Devices

12 + Years of Partnership

Better for
healthcare.
**Better for
the planet.**



**Practice
Greenhealth**

Sustainable Procurement

CIS11014 REV G | Copyright © 2023 Stryker

Thank You

Lauren.Koch@osumc.edu

[Sustainability | Ohio State Wexner Medical Center \(osu.edu\)](#)



Live Poll #2

What would you judge the #1 barrier to advancing reuse / reprocessing at facility(ies) you work with? *(check only one)*

- Costs (actual)
- Misperceptions (of costs, safety protocols, etc.)
- Resistance from medical staff
- Lack of service providers / vendors
- Other *(share in chat)*

Panel Q & A



Erika Kimball, RN
CEO & Principal
Kimball Sustainable
Healthcare



**Sarah Brockhaus
Kucinkas**
*Sustainability Programs
Manager*
UCLA Health



Victor Mitry
*Assist. Director,
Logistics & Materials
Management*
UCLA Health



Lauren Koch
*Sustainability Program
Manager*
The Ohio State University
Wexner Medical Center

Next Up...



ABOUT WASTE REDUCTION IN HEALTHCARE



FEATURING ERIKA KIMBALL, RN
CEO & PRINCIPAL
KIMBALL SUSTAINABLE HEALTHCARE

WEDNESDAY
FEBRUARY 21ST
1:00 - 2:00 PM ET

Learn more &
Register:



Today's Program Online



- Recording
- Presentation slides
- Links to resources

Learn More:



buschsystems.com/blog/webinars

Archived 2021 Program



Slides & Recording:

- Hospital waste composition study
- Mayo Clinic's recycling program
- Vancouver Waste prevention case study
- OR nurse's perspective



Archived Webinar Recordings

- Food organics collections*
- Centralized office collections*
- Strategic planning*
- Reuse & waste prevention*

+ more

Learn more at: buschsystems.com/blog/webinars





March 5 & 6, 2024

Topics:

- Local govt. communication strategies
- Glass recycling
- Extended Producer Responsibility
- Silver lining of China Nat. Sword
- Single use plastics
- Food service-ware Reuse systems
- Environmental & social justice

Learn more at:

nrcrecycles.org/2023congress



Thank You to Our Panelists



Erika Kimball, RN
CEO & Principal
Kimball Sustainable
Healthcare



**Sarah Brockhaus
Kucinskas**
*Sustainability Programs
Manager*
UCLA Health



Victor Mitry
*Assist. Director,
Logistics & Materials
Management*
UCLA Health



Lauren Koch
*Sustainability Program
Manager*
The Ohio State University
Wexner Medical Center

Please Share Feedback to Presenters



Post-Webinar Survey:

- Prompt at end of program, or
- Look for Email tomorrow



CONTACT

Michelle Dunn

Business Development Manager

705.722.0806 Ext. 1220

michelled@buschsystems.com

For all your product inquiries