IMPACT REPORT **2024**

HPRC
HEALTHCARE PLASTICS RECYCLING COUNCIL

Inspiring & Enabling Plastics Recycling Solutions in Healthcare

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Letter from the Executive Director

PEYLINA CHU

EXECUTIVE DIRECTOR, HPRC

Welcome to the Healthcare Plastics Recycling Council's (HPRC) inaugural Impact Report. This report highlights our journey towards a circular economy for healthcare plastics, showcasing our achievements, challenges, and the collaborative spirit driving our work. We believe that by working together, we can create a sustainable future for healthcare plastics, ensuring patient safety while minimizing environmental impact.

HPRC was founded 15 years ago with a focus on taking action to address the unique recycling challenges presented by plastics in healthcare. We are thrilled to see the growing interest in healthcare plastics sustainability, reflected in our expanding membership and the increased urgency within the healthcare sector. This report details the significant strides we've made, the strong partnerships we've forged, and the exciting path ahead.

The plastics industry is at a pivotal moment. Heightened public awareness, consumer pressures, and climate challenges are driving significant investment in sorting and recycling technologies, circularity, and sustainability. Simultaneously, the healthcare industry, responsible for 4.4% of global emissions (with the US contributing 27% of that footprint), is actively pursuing sustainability strategies and goals. This convergence of forces, coupled with HPRC's foundational work, growing membership, and strategic partnerships, positions us to make an even greater impact in the years to come. We invite you to explore this report and join us in building a more sustainable future for healthcare.

4.4% OF GLOBAL EMISSIONS ARE THE FROM HEALTHCARE INDUSTRY

US CONTRIBUTIONS TO GLOBAL FOOTPRINT **27%**

> *"Heightened public awareness, consumer pressures, and climate challenges are driving significant investment in sorting and recycling technologies, circularity, and sustainability."*

SECTION TWO

Understanding the Challenge

Modern healthcare relies heavily on plastics, a versatile material crucial for sterility, quality, durability, and, most importantly, patient and healthcare worker safety. However, the widespread use of single-use plastics in healthcare has significant environmental consequences. In 2020, over 32 billion pounds of healthcare plastics were produced globally, a figure projected to reach 48 billion pounds by 2025. The majority of this material, much of it uncontaminated and recyclable, ends up in landfills or incinerators. HPRC is committed to changing this paradigm.

What is HPRC?

HPRC is a private, technical coalition of industry peers across the healthcare, manufacturing, and recycling sectors. We focus on identifying barriers to healthcare plastics recycling and developing solutions across the entire value chain, from product design and manufacturing to product use, disposal, and recycling.

We envision a future where all healthcare plastics are safely and effectively recycled and recognized as a valuable resource supporting a circular economy.

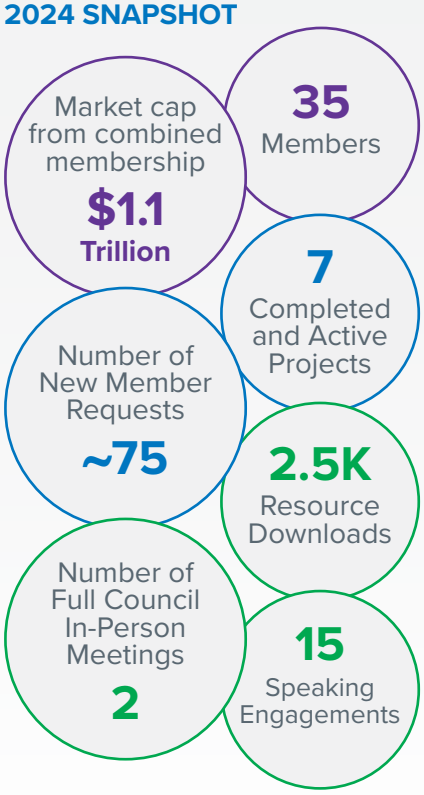
OUR VISION

All healthcare plastics are safely and effectively recycled and widely accepted as a valuable resource that supports a circular economy.

OUR MISSION

To collaborate across the value chain to inspire and enable the healthcare community to implement viable, safe, cost-effective, and circularity-advancing recycling solutions for plastics used in the delivery of healthcare.

2024 SNAPSHOT



OUR PURPOSE

HPRC serves as a platform for value chain stakeholders to enable the implementation of viable, safe, and cost-effective recycling solutions for plastics used in healthcare. We advocate for and help create a more sustainable and circular economy. HPRC currently operates in North America and Europe and will consider expanding to other regions as opportunities arise.

Members

HPRC members are industry leaders committed to shaping the future of plastics recycling and reducing their environmental footprint. Our current members include ACT Enviro, Amcor, B Braun, Baxter, BD, Boston Scientific, Brightmark, Casella, Dow, DuPont Tyvek®, Eastman, Edwards Lifesciences, Envetec, GOEX, W.L. Gore, Impact Plastics, Invista, Iron Mountain, Johnson & Johnson, Lakeside 360 Partners, LyondellBasell, Medtronic, Nelipak Healthcare Packaging, Nexus Circular, Oliver, Olympus, Paxxus, Plastic Ingenuity, Prent, Purecycle, Ravago, Sterimed, Stryker, Technimark, and WiiCare.

Governance

EXECUTIVE COMMITTEE
(9 elected members)

STEERING COMMITTEE
(One seat per strategic member)

FULL COUNCIL
(Unlimited per member)

HEALTHCARE FACILITIES ADVISORY BOARD (HFAB)

- Aarhus University Hospital
- Advocate Aurora Health
- Ascension Health
- Beth Israel Deaconess Medical Center
- Centre Hospitalier Emile Mayrisch
- Cleveland Clinic
- Dartmouth Hitchcock Medical Center
- Fresenius Medical Care
- Health Partners
- Hackensack Meridian Health
- Kaiser Permanente
- Lehigh Valley Health Network
- MIDT - Region Midtjylland
- NHS - Manchester University
- Northwell Health
- Ohio State University Wexner Medical Center
- Sharp Healthcare
- UMC Utrecht

KEY STAKEHOLDERS
Primary: Hospitals
Secondary: Value Chain Partners

EXECUTIVE COMMITTEE

The primary decision-making body responsible for strategic direction, fiscal management, and membership approval. Composed of nine members elected by the Steering Committee.

HEALTHCARE FACILITIES ADVISORY BOARD (HFAB)

Helps HPRC understand recycling barriers within healthcare facilities, prioritize projects, and collaborate on solution development.

STEERING COMMITTEE

Responsible for guiding the annual work plan and technical projects. One seat per Strategic Corporate Member.

FULL COUNCIL

Responsible for executing the annual work plan, project leadership, and active participation. Unlimited participation per member company.

KEY STAKEHOLDERS

Primary: Hospitals seeking to implement or improve plastics recycling programs.

Secondary: Stakeholders across the healthcare plastics value chain, including recyclers and manufacturers.

HPRC
HEALTHCARE PLASTICS RECYCLING COUNCIL

Sustainable Development Goals as a Framework for Impact

HPRC's work directly contributes to several UN Sustainable Development Goals. The Sustainable Development Goals (SDGs) are a set of 17 global objectives aimed at addressing challenges like poverty, inequality, climate change, environmental degradation, peace, and justice, to achieve a more sustainable future for all by 2030.

SDG 3: GOOD HEALTH & WELL-BEING

Ensure healthy lives and promote well-being for all at all ages. HPRC promotes safe and efficient healthcare plastics recycling, reducing waste and the risk of hazardous material exposure. This supports better patient care and public health outcomes by enabling access to resources and fostering a sustainable healthcare system.

SDG 12: RESPONSIBLE CONSUMPTION AND PRODUCTION

Ensure sustainable consumption and production patterns, which is key to sustaining the livelihoods of current and future generations. HPRC champions a circular economy for healthcare plastics, reducing reliance on virgin materials and promoting responsible practices that minimize waste and enhance recyclability.

SDG 13: CLIMATE ACTION

Reduce greenhouse gas emissions to limit global temperature rise to well below 2°C, maybe even 1.5°C. By diverting healthcare plastics from landfills and incineration, HPRC reduces greenhouse gas emissions and supports innovative, climate-friendly waste management solutions.

SDG 17: PARTNERSHIPS FOR THE GOALS

Revitalize global partnerships for sustainable development, ensuring no one is left behind. HPRC fosters collaboration among diverse stakeholders, building global networks and contributing to shared knowledge and strategies for meaningful change.

Aligning with Global Priorities

Additionally, HPRC's commitment aligns with the spirit of collaboration and sustainability emphasized in the United Nations' Pact for the Future document.

The Pact for the Future calls for multilateralism, cooperation, and shared responsibility to address global challenges. HPRC's collaborative approach aligns with this vision in several ways:

Transformative Actions for a Sustainable Future

Pact Pillar: Our Common Agenda & Sustainable Development

- The Pact calls for bold, coordinated strategies to accelerate progress on sustainability.
- HPRC's cross-industry innovation—such as researching new recycling technologies and creating design-for-recyclability guidelines—demonstrates a transformative approach to sustainable healthcare plastics.

Renewed Global Solidarity

Pact Pillar: Strengthening Trust & Solidarity

- The Pact emphasizes the need for collective action across sectors, nations, and industries to tackle sustainability challenges.
- HPRC embodies this by uniting private sector players, healthcare providers, and policymakers to address plastics pollution in healthcare—a challenge no single entity can solve alone.

Science, Technology & Innovation for the Common Good

Pact Pillar: Science & Technology Cooperation

- The Pact advocates for technology-sharing and cooperative research to drive sustainability efforts globally.
- HPRC contributes to this by supporting R&D on advanced recycling, ensuring that breakthroughs in material science are shared across the healthcare sector.

By fostering collaboration across the healthcare and waste management industries, HPRC exemplifies the kind of multi-stakeholder partnerships that the Pact envisions as essential for achieving global sustainability goals.

Flagship Work: Building a Foundation for Change

The Origin Story

The genesis of the Healthcare Plastics Recycling Council is a tale rooted in collaboration, environmental responsibility, and a shared vision for sustainability. Founded in 2010, HPRC emerged from the collective resolve of pioneering members—BD, Baxter, Cardinal Health, DuPont, Johnson & Johnson, Kimberly Clark, Engineered Plastics, and Waste Management—alongside leading healthcare institutions, Stanford University Medical Center and Kaiser Permanente.

In a landscape dominated by plastic waste, hospital staff were increasingly disconcerted by the sheer volume of disposable plastics being placed in trash bins and sent to landfills and incinerators each day. The environmental impact of this waste along with the healthcare mantra of 'do no harm' became the catalyst for change, prompting hospitals to challenge their suppliers to devise a solution.

Responding to the call, suppliers recognized that the complexity of healthcare plastics recycling demanded a collective approach. It was not feasible for individual suppliers to sort their own plastics after use; instead, they needed to unite under a common goal. They quickly understood that achieving meaningful change required collaboration across the entire plastics value chain, and thus, HPRC was born.

> ***"HPRC is the leading voice for recycling of healthcare plastics and has shined a light on an untapped, rich stream of materials ripe for recovery and return into new products."***
>
> **ROBERT RENDER**, PRESIDENT & CEO, LAKESIDE 360 PARTNERS

HPRC's founding mission was clear: to inspire and enable sustainable recycling solutions for healthcare plastics. By addressing barriers at each phase of the plastic lifecycle, HPRC has worked tirelessly to develop solutions that effectively remove obstacles to recycling. The council's efforts have not only driven technological advancements but also fostered multi-stakeholder partnerships essential for sustainability.

From the outset, HPRC's vision has been to create a future where healthcare plastics are recycled efficiently, reducing environmental impact and promoting a circular economy. Through innovative projects and continuous collaboration, HPRC continues to lead the charge towards a more sustainable healthcare industry, proving that environmental stewardship and industry growth can go hand in hand.

This origin story is a testament to the power of collective action and the unwavering commitment to a sustainable future. HPRC's journey underscores the importance of coming together to tackle the challenges of plastic pollution, and it remains an inspirational example of what can be achieved through cooperation and dedication.

Flagship Work: Building a Foundation for Change

FOUNDATIONAL PROJECTS

PROJECT: Design Guidance

GOAL

Improve recyclability and market value of healthcare plastics

QUANTIFIABLE IMPACT

954 downloads (since launch of new website in 2022)

The Design Guidance aims to influence the design of plastic healthcare products and packaging for improved recyclability without compromising product performance. It provides recommendations for preferred materials for mechanical recycling and explores future opportunities for advanced recycling.

A product's end-of-life is a critical design consideration. With Extended Producer Responsibility programs becoming mandatory, designing for recyclability is essential. This tool, developed by product and packaging engineers, identifies design features that hinder recycling and offers recommendations to enhance it. Examples include minimizing the use of multiple materials, avoiding paper tapes or labels, facilitating residue removal, and minimizing pigment use. The guidance is regularly updated to reflect current trends, technological advancements, and HPRC's expanding knowledge base. ***>> LEARN MORE***

> *"The HPRC Design Guidance is unique in the way that it focuses on designing healthcare products and packaging to be more compatible with current recycling infrastructure. There are many barriers to recycling healthcare products and packaging today, but it is through resources like this that we can start to shed some light on the possibilities for recycling these materials."*
>
> **RACHEL HOGAN**, HEALTHCARE FLEXIBLES R&D ENGINEER, AMCOR

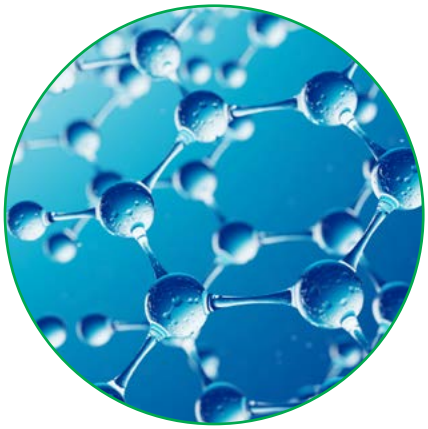
PROJECT: Advanced Recycling Research

GOAL

Explore advanced recycling as an opportunity for circularity for healthcare plastics

QUANTIFIABLE IMPACT

613 Downloads (since launch of new website in 2022)



HPRC's advanced recycling research began in 2020 and consists of a series of in-depth reports which seek to determine if advanced recycling technologies can and should be used to advance circularity of healthcare plastics. Each report builds on the findings of the previous report, creating a comprehensive study of advanced recycling technologies and their impact on healthcare plastics recycling. The research includes industry interviews, a market analysis of the global healthcare plastics landscape, mock waste stream evaluations, and a pilot study.

HPRC recognizes the importance of reduction and reuse but also explores advanced recycling technologies. HPRC emphasizes that advanced recycling complements, but does not replace, mechanical recycling. ***>> LEARN MORE***

FOUNDATIONAL PROJECTS

PROJECT: Hospicycle

GOAL

Support hospitals looking to implement a healthcare plastics recycling program

QUANTIFIABLE IMPACT

17 Tools, 11,161 views total (since launch of new website in 2022)

Hospicycle is a "how-to" guide that helps hospitals navigate the process of activating a plastics recycling program in clinical settings—from initial planning and business decisions to program implementation and improvement. It addresses economic, regulatory, resourcing, and infrastructure considerations.

Hospicycle offers a step-by-step approach to help hospitals integrate recycling practices. It is organized into three sections: Before You Begin (hospital readiness, executive support, financial considerations, finding a recycling partner), Getting Started (recycler identification, material identification, program development, space requirements, workflow, equipment needs, regulatory requirements), and Running/ Improving Your Program (implementation, progress measurement, economic tracking, communication).

>> LEARN MORE

PROJECT: Recycler Guidance

GOAL

Educate recyclers on the opportunity and value of healthcare plastics

QUANTIFIABLE IMPACT

170 Downloads (since launch of new website in 2022)

The Recycler Guidance aims to build the foundation for recycling activities across the healthcare industry. It provides a comprehensive overview of healthcare plastics recycling, including common materials, technical specifications, strategies for working with hospitals, processing techniques, potential end markets, and other resources.

This guidance informs recyclers and processors about common plastic waste streams generated in clinical settings. By outlining materials, strategies for working with hospitals, processing techniques, and potential markets, it aims to build a foundation for recycling activities. The guide covers common healthcare plastic waste streams, partnering with hospitals, recycling options (including mechanical processing), technical specifications, case studies, and other resources. ***>> LEARN MORE***

CASE STUDY

The Ohio State Wexner Medical Center Barrier Mapping

CHALLENGE

The Ohio State University Wexner Medical Center set a goal to become a zero-waste campus by 2025, aiming for 90% diversion of non-hazardous waste from landfills. However, the medical center faces several significant barriers in achieving this ambitious goal. Key challenges include inadequate staffing and training resources, difficulty in obtaining accurate real-time data about waste, and limited space in the facility to effectively sort and store waste materials.

SOLUTION

To address these challenges, the medical center focused on employee engagement and training through its sustainability council and educational initiatives. A waste dashboard was introduced to collect and analyze real-time waste data, and pilot recycling programs for healthcare plastics and blue sterilization wrap were implemented. Furthermore, the medical center adopted creative solutions for space constraints, such as partnering with a medical supply distributor for more efficient waste transport and considering investments in compactors for recycling materials.

RESULTS

These efforts have already resulted in a 37.4% landfill diversion rate as of FY 2022, with notable successes in recycling healthcare plastics and blue sterilization wrap. The pilot program for healthcare plastics has been collecting approximately 550 pounds of waste weekly, and the medical center diverted over five tons of blue sterilization wrap from landfills. The facility's ongoing efforts to expand these initiatives and address space and staffing challenges are expected to drive further progress toward the zero-waste goal, improving both waste diversion rates and operational efficiency. ***>> LEARN MORE***

CASE STUDY

Chicago Regional Recycling Project

CHALLENGE

The Healthcare Plastics Recycling Council (HPRC) and the Plastics Industry Association (PLASTICS) launched a regional recycling project in Chicago to address the low recycling rates of healthcare plastics. A key barrier was the insufficient volume of recyclable materials from individual hospitals to make recycling economically viable. Additionally, the healthcare setting's complex waste streams, including various types of plastics, made effective sorting and collection challenging. Hospitals faced logistical issues such as limited space for proper waste separation and the need for additional labor to handle recyclables.

SOLUTION

The project aimed to overcome these barriers by collaborating across multiple hospitals in the Chicago region, creating a critical mass of healthcare plastics to attract recyclers. Target materials included sterilization wrap, irrigation bottles, and flexible plastic packaging. Hospitals collected recyclables from operating rooms and ambulatory surgery centers, with a focus on simplifying the process for clinical staff. The project also explored alternative recycling methods, such as energy conversion and chemical recycling, to handle plastics that were difficult to recycle mechanically.

RESULTS

The project succeeded in identifying viable recycling streams, with sterilization wrap (polypropylene) and flexible plastics being the most collected. However, challenges such as contamination of recyclables and the limited economic value of mixed plastic streams persisted. Feedback from hospitals and recyclers emphasized the need for clear sorting instructions and a more streamlined process. Despite these challenges, the project demonstrated the potential for regional collaboration and provided valuable insights into the operational and economic feasibility of large-scale healthcare plastics recycling. Further steps include refining the model for wider adoption and exploring the use of alternative recycling technologies. *>> LEARN MORE*

> *"Uniquely as an action collaborative, HRPC brings together stakeholders from across the value chain, to collectively identify and prove-out the changes needed to enable effective circularity in Healthcare."*
>
> **NIC HUNT**, GLOBAL HEAD OF SUSTAINABILITY, NELIPAK HEALTHCARE PACKAGING

CASE STUDY

Collaborating Across Industries to Effectively Recycle Healthcare Plastics

CHALLENGE

The healthcare industry faces a significant challenge in managing plastic waste, as most healthcare plastics are single-use and end up in landfills or are incinerated. Despite the increasing amount of plastic waste generated, a large portion of it is recyclable, particularly in non-hazardous applications. The key hurdles for improving recycling rates include limited capacity to process diverse plastic types, low volumes of recyclable materials from individual hospitals, and logistical difficulties in waste sorting and collection.

SOLUTION

In 2023, Deaconess Midtown Hospital in Evansville, Indiana, partnered with key industry players—Berry Global, Evansville Packaging Supply (EPS), and Nexus Circular—to pilot a healthcare plastics recycling program. The initiative began in surgical suites, where plastic waste was collected in clear bags, separated from non-recyclable materials. This system was expanded to other hospital areas like pharmacies and laboratories. The collected materials were then sorted and sent to Nexus Circular's advanced recycling facility, where they were processed using pyrolysis to convert the plastics into high-quality pyrolysis oil, which is used to produce new plastic materials.

RESULTS

The collaboration successfully demonstrated the viability of recycling healthcare plastics, with early successes in surgical suite plastics collection. The program expanded to other areas within the hospital, with significant community engagement and employee training. However, challenges included the relatively low volume of recyclable plastics from individual hospitals and the complexity of sorting mixed materials. Despite these obstacles, the program has shown potential for scaling and serves as a model for other hospitals aiming to reduce plastic waste through circular recycling processes.

>> LEARN MORE

2024 Achievements

Through our work, HPRC seeks to apply our collective technical knowledge, experience, and resources to address barriers to healthcare plastics recycling and drive change in the industry. Each year, HPRC activities are evaluated against impact, capacity, and budgetary considerations. When outlining potential projects, HPRC asks the following questions:

Is it desirable?

Does this project solve a problem?

Is it feasible?

Can we realistically tackle it through the collective expertise of our members?

Is it viable?

Will it matter to key stakeholders?

Once project ideas have been solidified, project teams are formed, and team leaders are assigned to guide the project work. Here's a look at our 2024 project line up.

“Based on where we are today with our research and testing, we see transformative potential for advanced recycling to offer a viable solution for recycling healthcare plastics that would otherwise be destined for landfills or incineration. Additionally, these advanced recycling technologies present an opportunity to support a circular economy for healthcare plastics, reduce reliance on virgin plastic made from fossil fuels, and mitigate greenhouse gas emissions.”

PEYLINA CHU, HPRC EXECUTIVE DIRECTOR

PROJECT:

Advanced Recycling Guiding Principles

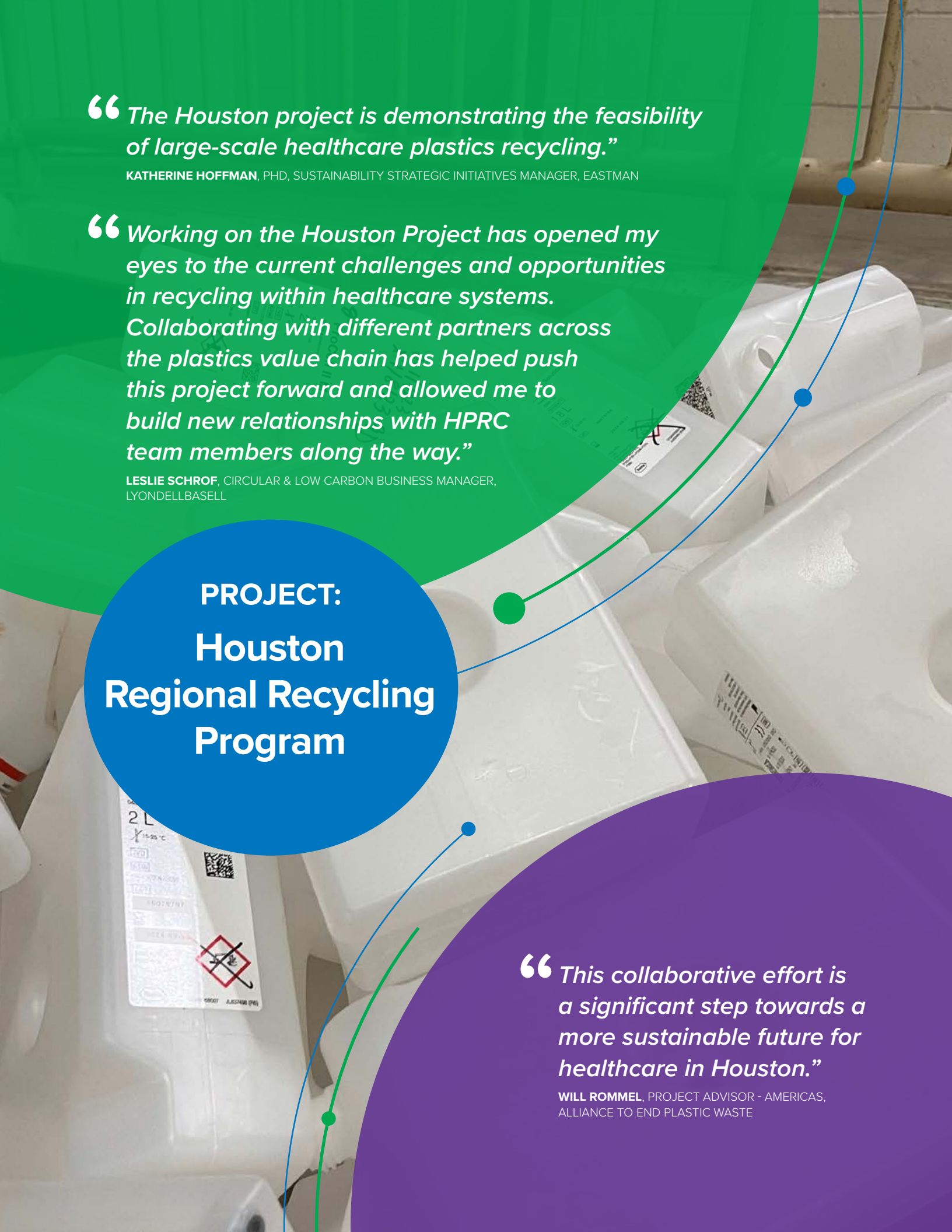
PROJECT: Advanced Recycling Guiding Principles

The *Guiding Principles for Advanced Recycling* outline HPRC's precepts regarding the use of advanced recycling technologies for healthcare plastics. They encompass topics such as efficient technology use, environmental and human health safeguards, claims and chain of custody, the complementary relationship with mechanical recycling, and circular enablement. ***>> LEARN MORE***

GOAL	Develop principles that clarify the healthcare industry's perspective on advanced recycling as a circularity solution, positioning it within the broader waste management hierarchy to foster informed adoption among stakeholders.
TEAM LEADS	Nick Packet (DuPont) and Lindsay Smaron (Boston Scientific)
PUBLISHED	February 28, 2024
QUANTIFIABLE IMPACT	**249 downloads** since publication.

Guiding Principles for Advanced Recycling

- **Utilize the Most Efficient Technology with Reduced Carbon Footprint**
- **Ensure Truthful Claims Supported by a Chain of Custody**
- **Prioritize Human Safety and Safeguard Nature**
- **Promote Material-to-Material Recycling for Circularity**
- **Complement Mechanical Recycling**



“The Houston project is demonstrating the feasibility of large-scale healthcare plastics recycling.”

KATHERINE HOFFMAN, PHD, SUSTAINABILITY STRATEGIC INITIATIVES MANAGER, EASTMAN

“Working on the Houston Project has opened my eyes to the current challenges and opportunities in recycling within healthcare systems. Collaborating with different partners across the plastics value chain has helped push this project forward and allowed me to build new relationships with HPRC team members along the way.”

LESLIE SCHROF, CIRCULAR & LOW CARBON BUSINESS MANAGER, LYONDELLBASELL

PROJECT:

Houston Regional Recycling Program

“This collaborative effort is a significant step towards a more sustainable future for healthcare in Houston.”

WILL ROMMEL, PROJECT ADVISOR - AMERICAS, ALLIANCE TO END PLASTIC WASTE

PROJECT: Houston Regional Recycling Program

This project aims to initiate a regional healthcare plastics recycling program in Houston, in collaboration with the Alliance to End Plastic Waste, the Vinyl Institute, and Houston Methodist Hospital. The initiative seeks to optimize the recycling program by expanding to multiple hospitals and create a model for other regions.

TEAM LEADS

Katherine Hofmann (Eastman) and Brian Tran (Dow)

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Waste Audit Data from Houston Methodist network.

CHALLENGES & SOLUTIONS

One of the biggest challenges in launching a healthcare plastics recycling program is achieving the scale needed to make the process economically viable. Haulers, sorters, and end users all require significant volumes of material to justify the investment in collection, sorting, and processing. However, rolling out a pilot program while simultaneously trying to build a new industry process presents a catch-22. Without sufficient volume, stakeholders may be hesitant to commit, yet scaling up requires initial buy-in and infrastructure. Additionally, securing a stable end-use market for the recycled material remains a critical hurdle. Hospitals, haulers, and sorters all want assurance that there is a consistent buyer for the material before fully engaging in the program. To overcome these barriers, the team is working to aggregate material from multiple waste streams or hospitals, collaborate with key industry players to identify viable end markets, and refine logistics to optimize collection and processing.

NEXT STEPS

The project team is working to establish resources and timelines for the Cypress location, working with waste management and other haulers on collection program design, and continuing to evaluate materials for collection.

> *"This project underscores the essential role of advanced recycling in achieving circularity within the healthcare sector. Due to the complexity of medical waste streams, diverse material compositions, and stringent regulatory requirements, advanced recycling technologies will be crucial in closing the loop where mechanical recycling alone is insufficient."*
>
> **ADAM WOZNIAK**, SENIOR MANAGER OF SUSTAINABILITY, RAVAGO

PROJECT:

Technologies for Plastic Sortation

> *"The Sorting Project has provided valuable insights into the capabilities and limitations of current sorting technologies."*
>
> **SARAH WEBBER**, SUSTAINABLE PACKAGING ENGINEER, PLASTIC INGENUITY

PROJECT: Technologies for Plastic Sortation

This project aims to optimize healthcare plastics recycling through advanced sorting technologies. It includes a comprehensive survey of sorting companies to understand their technologies, capabilities, and preferred materials, and will culminate in a report featuring a geographical map of Plastics Recovery Facilities (PRFs) and sorting technologies, as well as a matrix detailing the capabilities of selected technologies.

TEAM LEADS

Sarah Webber (Plastic Ingenuity), Adam Wozniak (Ravago), Paul D'Annunzio (Ascension Health), Elaine Wagener (Casella)

QUANTIFIABLE IMPACT

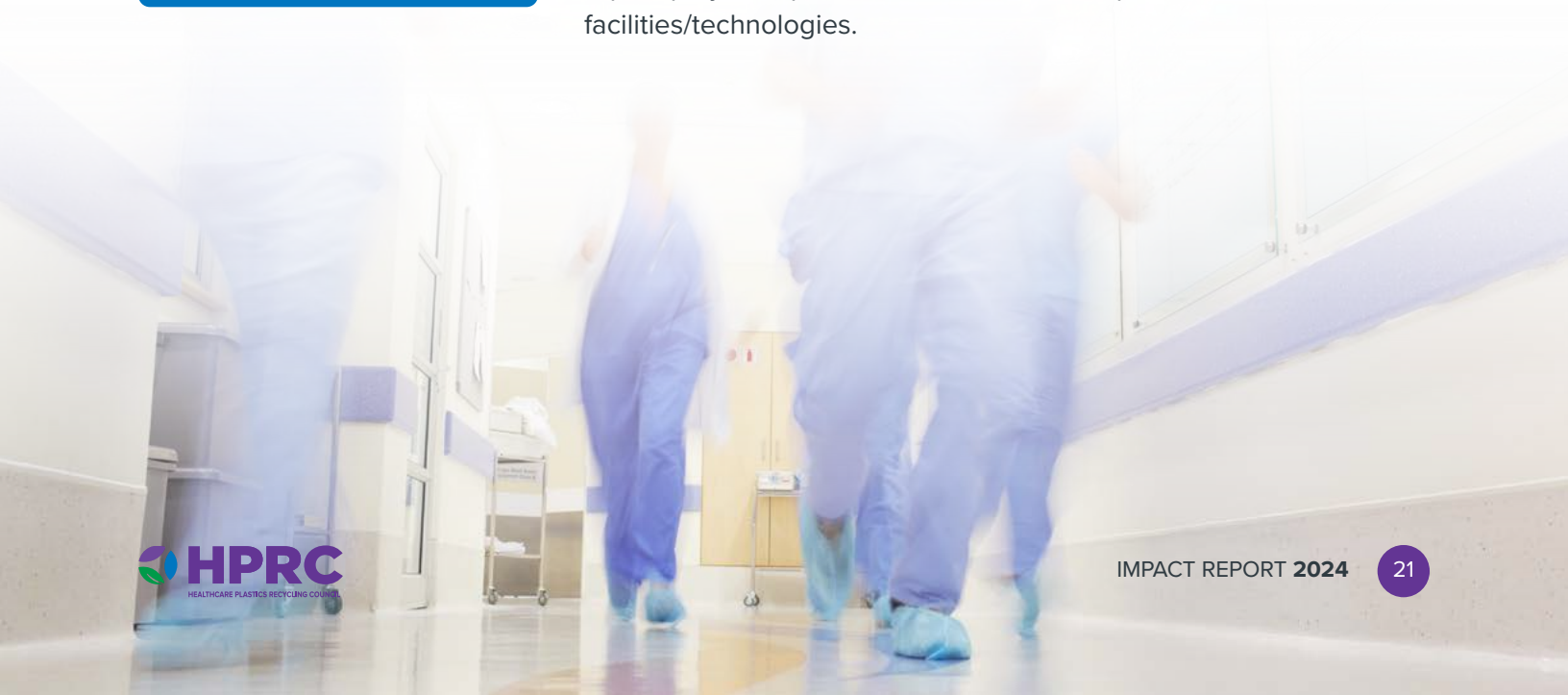
12 interviews conducted. Key takeaways include the importance of safety guarantees, financial incentives for recyclers, and the need for guaranteed volumes and end markets.

CHALLENGES & SOLUTIONS

One of the key challenges in optimizing healthcare plastics recycling is the limited number of PRFs equipped to handle medical plastics, as well as the variability in sorting technologies. Many PRFs are designed for traditional recycling streams and may not be optimized for the diverse material compositions found in healthcare settings. Additionally, recyclers and sorting facilities require consistent, high-volume streams of specific plastic types to make investment in advanced sorting technologies financially viable. Without guaranteed feedstock and end markets, it is difficult to scale solutions. To address these barriers, the project team surveyed and mapped existing PRF capabilities and identifying opportunities for investment in new technologies.

NEXT STEPS

A pilot project is planned for 2025 with hospitals and sortation facilities/technologies.



“Sustainable procurement practices are key to driving demand for recycled healthcare plastics.”

MICHELLE BEZDEK, GLOBAL SUSTAINABILITY LEADER, W.L. GORE

PROJECT:

Sustainable Procurement Criteria

“By working with GPOs, we can create a market for these materials and incentivize recycling.”

ANNIE HUKILL, SENIOR MANAGER, CORPORATE SUSTAINABILITY, STRYKER

PROJECT: Sustainable Procurement Criteria

This project seeks to harmonize procurement language and standardize group purchasing organization (GPO) questionnaires to clarify supplier requirements for manufacturers. This aims to drive investment in sustainable practices and increase circularity within healthcare plastics.

TEAM LEADS Michelle Bezdek (W.L. Gore) and Annie Hukill (Stryker)

Based on the first year of work, the project team has developed the following set of criteria for sustainable procurement:

No.	Criteria	Thematic Group(s)	Waste Hierarchy Alignment	Design Guidance Alignment
1	Contains PVC	Recyclability/ Chemicals of Concern	3 - Recyclable	Not Preferred
2	Contains Polystyrene	Recyclability	3 - Recyclable	Not Preferred
3	Is Recyclable	Recyclability	3 - Recyclable	Preferred Categories in Resins, colors, labels, etc.
4	Contains Recycled Content (details: e.g. PCR, PIR, % used, etc,)	Recycled Content	3 - Recyclable	Preferred when regulatory constraints allow
5	Consumer Friendly Recycling Labels (i.e. how-to-recycle)	Recyclability	3 - Recyclable	
6	Designed for Reuse	Reuse	2 - Reuse	
7	Designed to be Reprocessable	Reuse	2 - Reuse	

CHALLENGES & SOLUTIONS

The project faced several challenges, primarily due to scope limitations that focused solely on recyclability criteria while excluding chemicals of concern. However, many engaged stakeholders were primarily interested in criteria related to chemicals of concern, creating a misalignment in expectations. Stakeholder engagement also proved challenging, as only three of the seven identified stakeholders participated in interviews. The process highlighted the need to further explore what full alignment would entail and create clear expectations for stakeholders utilizing the criteria.

2025 WORK PLAN

Sustainable Procurement Criteria *(continuation of work)*

PROJECT LEADS

Anna Sczaniecka (Olympus) and Karen Kearns (GOEX)

BARRIER

Inconsistent supplier requirements pose a barrier for manufacturers to justify investments in more sustainable attributes. This project seeks to work towards further alignment in industry around sustainable procurement criteria specific to healthcare plastics circularity. This alignment will facilitate manufacturer decision-making and justify investments in sustainable procurement. This project builds on the work completed in FY24.

STRATEGY

The project team will continue to engage with and facilitate discussions with major group purchasing organizations with a focus on harmonizing the language used within the procurement criteria. A critical component of our project will involve standardizing the way questions are asked within procurement questionnaires and providing clearer guidance for those completing them.

Houston Regional Recycling Program *(continuation of work)*

PROJECT LEADS

Brian Tran (Dow) and Katherine Hofmann (Eastman)

BARRIER

Experience has identified the cost-prohibitive challenges of recycling small quantities of plastics from individual healthcare facilities. This project builds on the work completed in FY24.

STRATEGY

This project aims to initiate a regional healthcare plastics recycling program in Houston. The Houston initiative will be a collaborative effort with the Alliance to End Plastic Waste (AEPW) and the Vinyl Institute, starting with the Houston Methodist healthcare network. This initiative will aim to optimize the recycling program by expanding to multiple hospitals in the region.

The goal is to create a model program that showcases effective collaboration and responsible plastic recycling practices within a network of hospitals that can serve as a blueprint for other regions.

2025 WORK PLAN

Identifying Synergistic Materials Outside the Hospital

PROJECT LEADS

Elaine Wagener (Casella) and Ryan Lee (Invista)

BARRIER

The quantity of non-patient contact plastics (packaging) is limited, which increases the cost of a recycling program.

STRATEGY

The project intends to identify similar plastics used in other medical settings outside of hospitals, such as clinics, blood/plasma donation centers, kidney dialysis centers, etc., that could be combined with a mixed stream of hospital plastics. The project team will determine where high volumes of plastic waste near hospitals may be and will map facility types around a hospital to understand waste infrastructure. The project team will then survey these facilities to understand their interest level, space available, materials used, sustainability maturity, and current waste practices and processes. This survey will then be used to understand each facility's waste streams and determine if plastic waste collection can reduce the cost of a recycling program.

Identifying Synergistic Materials Inside the Hospital

PROJECT LEADS

Bob Render (Lakeside 360 Partners) and Jenn Mitchell (W.L. Gore)

BARRIER

The quantity of non-patient contact plastics (packaging) is limited, which increases the cost of a recycling program.

STRATEGY

The project intends to identify synergistic materials for recycling within hospitals, including patient-contact, infectious, and hazardous plastics that could be disinfected or sterilized and recycled for the highest value. This work will be completed through both a hospital approach and a medical device manufacturer (MDM) approach. The hospital approach will include interviews to identify plastics in hospitals beyond operating rooms (ORs) and clinical areas as well as a sortation/characterization event, survey, and/or interview to understand red bag contents. The MDM approach will include a survey for MDM's that produce high volume, plastic-rich single use devices in order to determine what types of resins and form factors are used. The survey will also help to determine what the current practices/processes are for MDM's extended producer responsibility (EPR) policies.

2025 WORK PLAN

Life Cycle Assessment (LCA) Analysis

PROJECT LEADS

Brian Ingraham (Amcor), Milagro Lopez (Dupont), Erin Gately (Iron Mountain)

BARRIER

There is limited understanding of the reduction of environmental impacts of recycling (both advanced and mechanical) compared with landfill and incineration.

STRATEGY

The project seeks to collect and review existing LCAs to identify and summarize information on the environmental impact of recycling, including advanced recycling, compared to other disposal options. The project team will define the criteria an LCA must meet for review, including timeframe, methodologies, and geography. The project team will also determine what criteria constitutes a “good” LCA, including identifying where there are information gaps. After reviewing LCAs which meet the defined criteria, the information gathered from this analysis will be used to educate stakeholders on the impacts of different recycling methods and provide them with a list of key questions to ask to help inform their decision making.

Additional HPRC Europe Projects

Sortation Best Practices

This project aims to analyze the best practices in sorting for optimal value across specific regions within EU healthcare organizations. Recent legislation on sustainability and the initiatives among several hospitals will be examined regarding its impact on waste sorting in European hospitals.

Review of EU Healthcare Plastic Recycling Systems

This project aims to examine viable healthcare plastics recycling systems in selected EU territories. After a successful trial in the Netherlands, the goal is to replicate the Hospital Plastics Sorting and Recycling Processes Project in another region on a larger scale.

Importance of Stakeholder Engagement

HPRC recognizes that collaboration is essential for tackling the challenges of healthcare plastics recycling. We actively engage with stakeholders through various channels, including events, webinars, panel discussions, content creation, and joint projects.

OUR PARTNERS

We recognize that we don't work alone and that there are many opportunities for collaboration and shared learnings in the plastics recycling space. With this understanding, HPRC looks to collaborate with other key stakeholder groups whenever possible to ensure our work is informed by a broad range of insights, create meaningful synergies, and avoid duplication of efforts.

HPRC collaborates with key partners, including the Alliance to End Plastic Waste (AEPW), PLASTICS, the Association of Plastic Recyclers (APR), Circular Plastics Alliance, Closed Loop Partners, Practice Greenhealth, RecyClass, and Vizient, to maximize impact and avoid duplication of efforts.

PARTNER LED PROJECTS

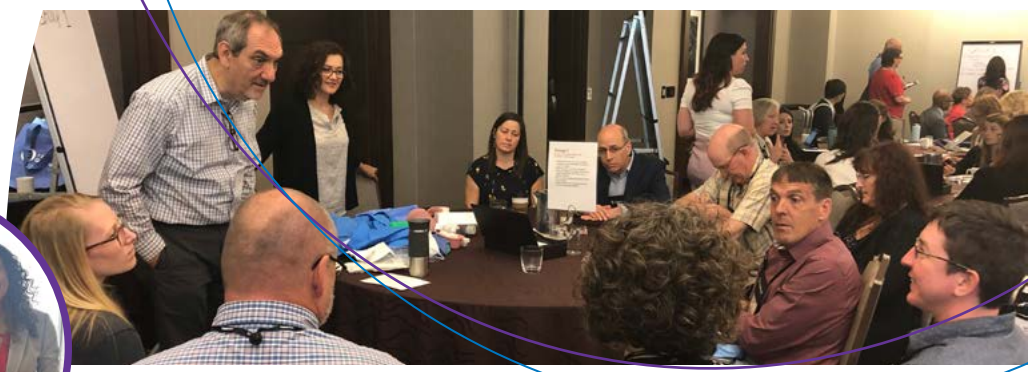
- **Advanced Recycling Equivalency Position Paper led by Kilmer Innovations in Packaging (KiiP):** Medical Device Manufacturers and packaging companies are eager to incorporate advanced recycled materials into sterile barrier packaging. While it appears technically feasible, there are real and/or perceived barriers to obtaining regulatory approval for sterile barrier packaging that includes advanced recycled material. KiiP is addressing this challenge by preparing a technical position paper "proving equivalence at the polymer level" for advanced recycled materials. Eastman is leading the preparation of the initial technical position paper based on PETG resin. HPRC has offered to provide review by MDM member companies as a key stakeholder for feedback.
- **ASTM Standard Development:** We aim to transition the HPRC Design Guidance to an ASTM International Standard to improve industry-wide adoption. The absence of a formal standard currently limits widespread acceptance and implementation within the industry. By aligning with ASTM International, a globally recognized standards organization, we will establish an industry standard for designing healthcare packaging and products for greater recyclability. This effort allows for HPRC learnings to be incorporated into a global industry standard for greater impact and increased recyclability of healthcare plastics.
- **Columbia University Sustainability Program Curriculum:** The project was a collaborative venture between HPRC and Columbia University, structured in a classroom format. The primary objective was to investigate monetization opportunities associated with establishing a circular plastics supply chain with a focus on medical packaging and medical devices. Through this collaborative initiative, selected students from Columbia University actively participated in the exploration process, working closely with experienced mentors from HPRC. The students provided a detailed research paper and an end-of-semester presentation to HPRC.

Stakeholder Engagement: Building a Collaborative Movement

Industry Forums and Events

In 2024, HPRC participated in the following industry forums and events:

- Plastics Roundtable at The Baker Institute
- Levi Symposium – The Value(s) of Disposability in Health Care
- Medical Packaging Conference | DuPont
- SPC Advance
- Advanced Recycling Summit
- 2024 PLASTICS Recycling Open House
- Webinar: Hitting your sustainability goals with innovative recycling solutions
- CleanMed 2024
- Medtech Sustainability Forum
- the[PACK]out
- NPE2024 | The Plastics Show
- Waste Expo
- Plastics Recycling Conference
- AMI Chemical Recycling Event
- Pharmapack Europe



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HEALTHCARE PLASTICS RECYCLING COUNCIL

Stakeholder Engagement: Building a Collaborative Movement

BUSINESS COALITION FOR A GLOBAL PLASTICS TREATY

In 2024, HPRC announced its support for the Business Coalition for a Global Plastics Treaty, an initiative convened by the Ellen MacArthur Foundation and World Wildlife Fund.

With this support, HPRC joins over 200 businesses spanning the plastics value chain, financial institutions, and NGO partners, amplifying the call for an effective UN treaty that transitions plastics into a circular economy, preventing them from becoming pollution.

HPRC recognizes the critical importance of collective action in addressing the plastics crisis. By aligning with the Business Coalition for a Global Plastics Treaty, we reaffirm our commitment to driving meaningful change within the healthcare industry and beyond.

> *"Plastics are critical to effective global healthcare, and while healthcare plastics are just one small portion of the collective plastic pollution problem our world is facing, there are unique challenges and opportunities associated with these materials. Supporting the Business Coalition for a Global Plastics Treaty allows organizations like HPRC to have our voices amplified and contribute to the greater goal of a circular plastics economy."*
>
> **PEYLINA CHU**, HPRC EXECUTIVE DIRECTOR

Appendix

HPRC Director and Executive Committee Profiles.

Peylina Chu

Executive Director of HPRC and Senior Vice President | Antea Group USA

Peylina Chu leads ESG Business Strategy at Antea Group. Through her 25+ years of experience, Peylina has helped numerous global organizations develop and implement multifaceted ESG strategies and programs. Using her technical expertise as a Registered Professional Chemical Engineer and her experience with stakeholder engagement and organizational change, she works with organizations to translate ESG strategy into meaningful business practices that achieve sustainable outcomes. Her work has had a significant impact on the business community, driving positive change in areas such as climate change, occupational health and safety, and resource management.

Tracy Taszarek

North America Director of HPRC and Consultant | Antea Group USA

Tracy Taszarek is a people-focused Environmental Health and Safety (EHS) professional with over two decades of experience managing EHS programs across office, manufacturing, and field-based environments. Known for her strong communication skills and collaborative approach, Tracy is passionate about ensuring compliance and driving continuous improvement in workplace health and safety. She currently serves as the North America Director of HPRC, where she leads key projects, speaks at industry events, and facilitates council meetings. Tracy holds a Bachelor of Science in Civil Engineering from North Dakota State University.

Alison Bryant

Communications Director, HPRC and Senior Consultant | Antea Group USA

Leveraging 15 years of experience in strategic marketing and communications, Alison Bryant is a Senior Consultant at Antea Group and has served as the Communications Director for the Healthcare Plastics Recycling Council (HPRC) since its inception in 2010. In this role, she works to elevate awareness of HPRC's critical work and achievements across various stakeholder groups, and cultivate relationships and engagement opportunities that advance the HPRC mission of inspiring and enabling plastic recycling solutions in healthcare.

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HPRC Director and Executive Committee Profiles.

Tom Frantz

Director of Advanced Materials Development | Technimark LLC

With 40 years' experience in the polyolefins industry, Tom Frantz has a technical background working in research, operations, and development positions. At Technimark, Tom leads the material science team providing development support for Technimark's recycling division as well as design for recyclability support with its clients. Tom is the vice Chair of the APR Board of Directors, chair of the APR Olefins Technical Committee and participates in the APR Chemical Recycling Working Group. Tom is a subject matter expert for the Closed Loop Partners Infrastructure Investment Committee since 2022.

Dwane Hahn

Chief Strategy Officer, VP Sales & Marketing | PAXXUS

Dwane Hahn has been at PAXXUS for almost 30 years. He received his Master of Science in Technology Commercialization at the McCombs School of Business at the University of Texas Austin, and is also an award-winning mentor and judge for Business Plan competitions. When he's not strategizing how to position PAXXUS for future growth, Dwane can be found somewhere along the US Coast saltwater fly-fishing and working towards preserving our coastal wetlands.

Katherine Hofmann

Sustainability Strategic Initiatives Manager | Eastman

After receiving her Ph.D in polymer science, Katherine Hofmann joined Eastman in 2012 as part of the Plastics Technology Division. During this time, she began working with the sustainability team and was an integral part of launching Tritan Renew and other molecularly recycled plastics as well as assisting companies across industries with ISCC PLUS certification. In 2022 Katherine joined the corporate sustainability team full time and currently supports the Plastics organization, including the medical segment.

Brian Ingraham

Senior Research & Development Director, Healthcare | Amcor

Brian Ingraham is currently the Sr. R&D Director, Healthcare for Amcor's North American flexibles business. He has over 27 years of experience working in flexible packaging with 20+ years focused on healthcare packaging. Brian has a strong track record of partnering with healthcare manufacturers to deliver packaging innovations. This track record includes 4 patents and 5 FPA awards where Brian was the lead developer. Brian is passionate about delivering technical solutions, including sustainable packaging.

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Amit Limaye

Director, Sustainable Medical Technology Institute (SMTI) | Becton Dickinson & Company

Amit Limaye leads the Sustainable Medical Technology Institute (SMTI) at Becton Dickinson, which was created to reduce the environmental impact of its product portfolio. As the founding member, Amit has had the opportunity to create the strategy for the institute and make it actionable. In his 14 years at BD, he held different roles in R&D, including Innovation and New Product Development. He is an inventor on 35 patents and has a Ph.D in Chemical Engineering with a background in Biotechnology.

Zach Muscato

Corporate Sustainability Manager | Plastic Ingenuity

Zach Muscato is the Corporate Sustainability Manager at Plastic Ingenuity, a leading custom thermoforming company located in Madison, WI. In his role, he is responsible for helping organizations achieve their sustainability and circularity objectives. With over 20 years of experience in the thermoformed packaging industry, Zach has held various positions from product development to commercial sales. Throughout his career, he has demonstrated a steadfast passion for sustainable packaging.

Robert Render

President & CEO | Lakeside 360 Partners

Bob Render is the President and CEO of Lakeside 360 Partners, a sustainability and recycling consulting firm that develops programs that companies use to reduce their carbon impact. This includes incorporating recycled and renewable content in products, feed stock development for mechanical and advanced recycling, and baselining carbon impacts. Bob has been an active participant in HPRC for over eight years and brings over 40 years of experience in processing recyclable materials and recycling markets to the HPRC Executive Committee.

Nic Hunt

Global Head of Sustainability | Nelipak

Nic Hunt is the Senior Director and Global Head of Sustainability at Nelipak. Nic is focused on the rapidly changing purpose of materials in making the world more sustainable and healthier, with a better quality of life. Nic's experience spans plastic, fiber-based, and nonwoven materials in the packaging, conversion, assembly, contract packaging, and composite materials industries.

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Milagro Lopez

Americas Marketing Leader | DuPont

Milagro E. Lopez, MS., MBA, has an undergraduate in Chemistry, an M.S. in Public Policy Analysis, and a Masters In Business Administration all from the University of Rochester, in Rochester, New York. He has been part of the biopharmaceutical industry for over 20 years working in a number of key commercial functions with increasing responsibility within West Pharmaceutical Services, GSK, and Merck, helping to create, enhance, and deliver greater value for small and large molecule products to healthcare providers and their patients. Most recently, he joined DuPont as Americas Marketing Leader to help drive strategy for the healthcare packaging segment across medical devices and in-process biopharmaceutical packaging verticals and grow the healthcare applications pipeline.

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Learn more about HPRC and our initiatives on our website: **hprc.org**
For further inquiries, please contact: **info@hprc.org**