

WPS INSIGHT

JUNE 2026





June highlights a fundamental shift in how the packaging industry is approaching sustainability. The conversation is moving beyond material selection and environmental commitments toward a more demanding question of whether circularity can be supported by infrastructure, data, and proven outcomes.

Across the industry, innovation is increasingly focused on improving end-of-life performance without sacrificing functionality. From cellulose-based alternatives designed to work within existing recycling systems to new approaches that redesign polymer chemistry for improved degradation, material development is becoming more closely tied to circular economy objectives.

At the same time, regulatory momentum continues to accelerate globally. Extended Producer Responsibility programs, recycled-content mandates, packaging traceability requirements, and recyclability targets are expanding across major markets. Compliance is becoming a strategic business requirement rather than a future consideration.

Another clear trend is the growing importance of evidence-based decision making. Whether evaluating material choices, recyclability claims, or circular packaging strategies, companies are increasingly expected to demonstrate performance through measurable data, established recovery pathways, and verified end markets.

The direction is becoming clear. Success will depend not only on developing better packaging materials, but also on building the systems, infrastructure, and accountability mechanisms needed to support a truly circular packaging economy.

EXECUTIVE TAKEAWAYS

◆ Circularity is increasingly dependent on system readiness

Material innovation alone is no longer sufficient. Packaging solutions must align with existing converting, collection, and recycling infrastructure to scale effectively.

◆ Global regulation is moving sustainability from aspiration to obligation

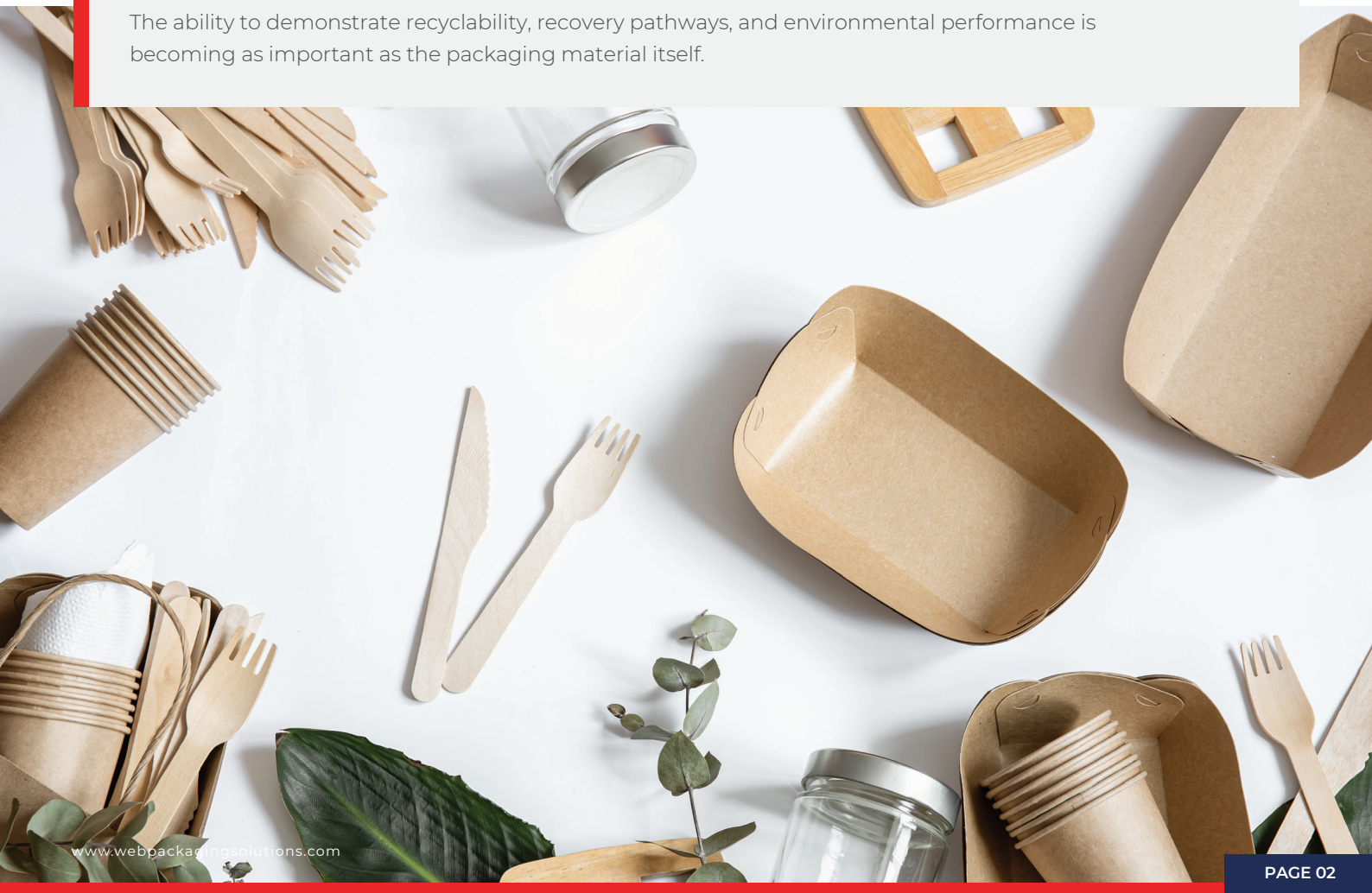
Governments are expanding requirements related to recyclability, recycled content, traceability, and producer responsibility across major packaging markets.

◆ Material innovation is increasingly focused on end-of-life outcomes

Researchers and material developers are redesigning both renewable and conventional materials to improve recyclability, degradability, and circular performance.

◆ Data and verifiable outcomes are becoming critical competitive advantages

The ability to demonstrate recyclability, recovery pathways, and environmental performance is becoming as important as the packaging material itself.



Cellulose Platforms Bring Fiber-Based Alternatives Closer to Mainstream Adoption

WHY IT MATTERS

Cellulose-based materials are increasingly demonstrating that renewable packaging alternatives can achieve the barrier performance, processability, and scalability required for commercial packaging applications while supporting circular economy objectives.

EXECUTIVE TAKEAWAYS

- Advanced cellulose films achieved oxygen transmission rates below **1 cc/m²/day**
- Barrier-coated versions delivered oxygen transmission rates below **0.2 cc/m²/day**
- Materials achieved KIT 12 grease resistance, supporting demanding food packaging applications
- Suitable for food packaging, transparent barrier applications, and fiber-based packaging systems
- Supports recyclability within existing fiber recovery streams
- Biodegradability can be incorporated depending on application requirements
- Reduces dependence on fossil-based plastic materials
- Aligns with PPWR objectives focused on reducing plastic use and improving recyclability
- Compatible with conventional converting operations and thermoforming processes
- Existing recycling systems can accommodate the material platform
- Adoption may not require significant equipment investments



EXECUTIVE TAKEAWAYS

- Initial commercial focus includes bakery packaging, dry food packaging, and fiber-based structures requiring transparent barriers
- Pilot-scale production has already been demonstrated across multiple packaging applications
- Future developments may include antimicrobial functionality, active packaging systems, sensor-enabled packaging, and connected packaging technologies
- Ongoing innovation efforts are focused on improving performance in high-humidity environments, scaling production capacity, and integrating multiple functionalities into a single platform

LESSONS & ACTIONABLES

Alternative materials will scale more rapidly when sustainability improvements are delivered without disrupting existing manufacturing and recycling infrastructure.

Global Packaging Regulation Enters a New Phase of Accountability

WHY IT MATTERS

Governments across major markets are shifting from voluntary sustainability frameworks toward enforceable packaging regulations that increasingly require traceability, recycled content, producer responsibility, and measurable circularity outcomes.



Regional Regulatory Developments

REGION	KEY DEVELOPMENTS
United States	Multiple states expanded restrictions on plastics, PFAS, phthalates, polystyrene, and single-use packaging formats.
Maine	Restrictions on PFAS and phthalates in certain food packaging applications.
New Jersey	"Skip the Stuff" requirements limit automatic distribution of utensils and condiments.
New York	Expanded restrictions on polystyrene foam packaging and small hotel toiletry bottles.
Virginia	Expanded statewide restrictions on expanded polystyrene food containers.
California	Strengthened plastic bag regulations and continued implementation of SB 54. Targets include a 10% reduction in single-use plastics by 2027, a 65% recycling rate by 2032, and 100% recyclable or compostable packaging by 2032.

Regional Regulatory Developments

REGION	KEY DEVELOPMENTS
Washington	Increased fees on reusable carryout bags and strengthened enforcement.
Illinois	Banned personal care products packaged in plastic bottles within state-owned hotels.
Canada	Launched the Federal Plastics Registry covering packaging, electronics, and single-use plastics. The country generates nearly 5 million tons of plastic waste annually.
European Union	PPWR becomes operational in August 2026. Requirements cover design, recyclability, reuse, labeling, material restrictions, and waste management.
India	Expanded Plastic Waste Management Rules under EPR. Packaging traceability through QR codes and barcodes becomes increasingly important.
China	Introduced nine new packaging design and recycling standards supporting circular economy goals.
Middle East	UAE, Saudi Arabia, Qatar, and Oman expanded restrictions on single-use plastics while encouraging biodegradable, compostable, and reusable alternatives.

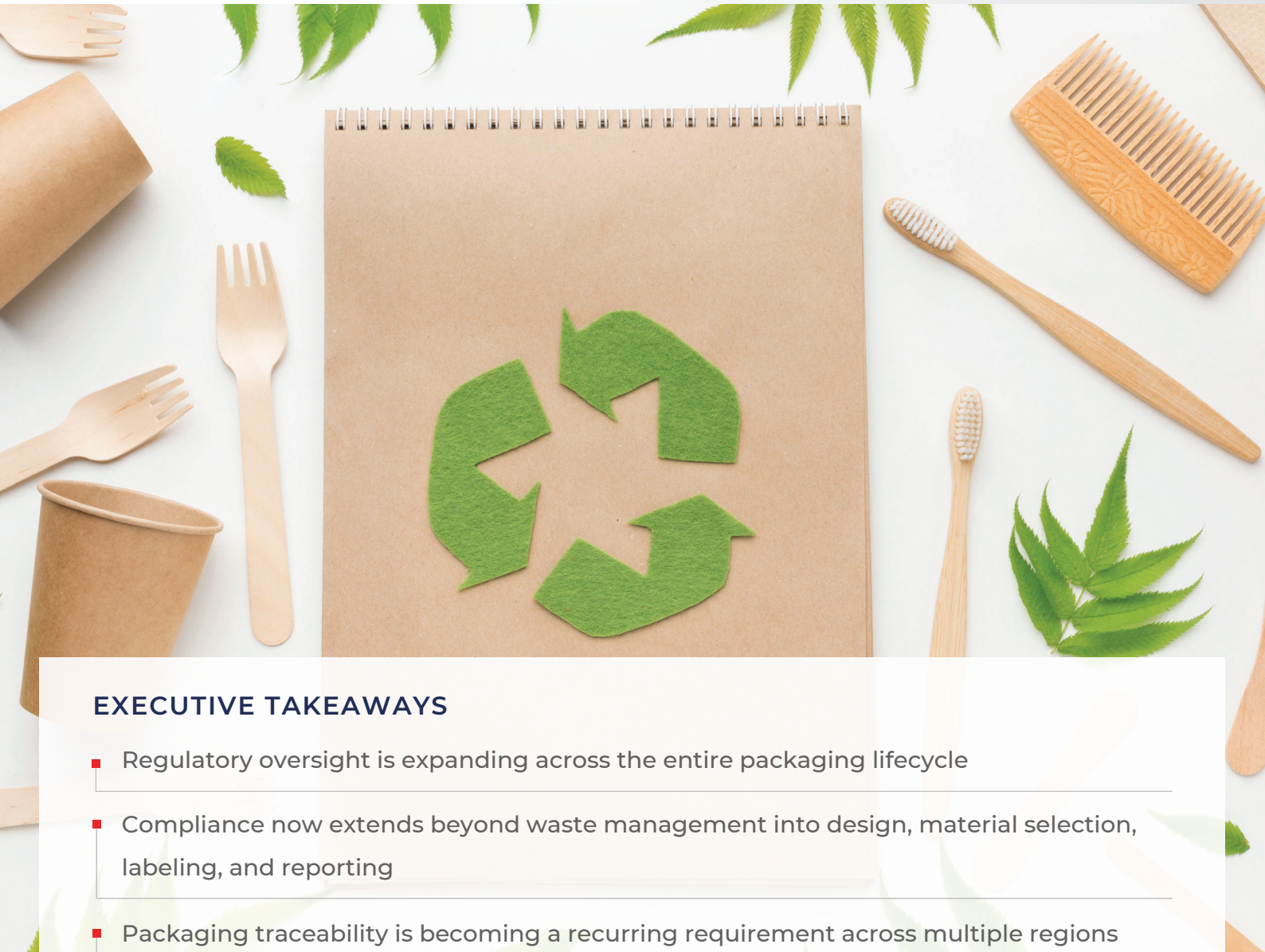


Key Recycled Content Requirements in India

PACKAGING TYPE	REQUIREMENT
Rigid Plastic Packaging	30% recycled content in 2025-26, increasing to 60% by 2028-29
Flexible Packaging	10% to 20% recycled content
Multilayer Packaging	5% to 10% recycled content

Key PPWR Objectives

OBJECTIVE	TARGET
Packaging recyclability	All packaging recyclable in an economically viable way by 2030
Beverage container collection	90% collection rate by 2029
Material usage	Increased recycled plastic content and reduced virgin material consumption



EXECUTIVE TAKEAWAYS

- Regulatory oversight is expanding across the entire packaging lifecycle
- Compliance now extends beyond waste management into design, material selection, labeling, and reporting
- Packaging traceability is becoming a recurring requirement across multiple regions
- Recycled-content mandates are expanding globally
- Producer responsibility frameworks continue to gain momentum
- PFAS restrictions are becoming increasingly common
- Recyclability and reuse targets are becoming more prescriptive
- Stronger data management capabilities are becoming essential for compliance

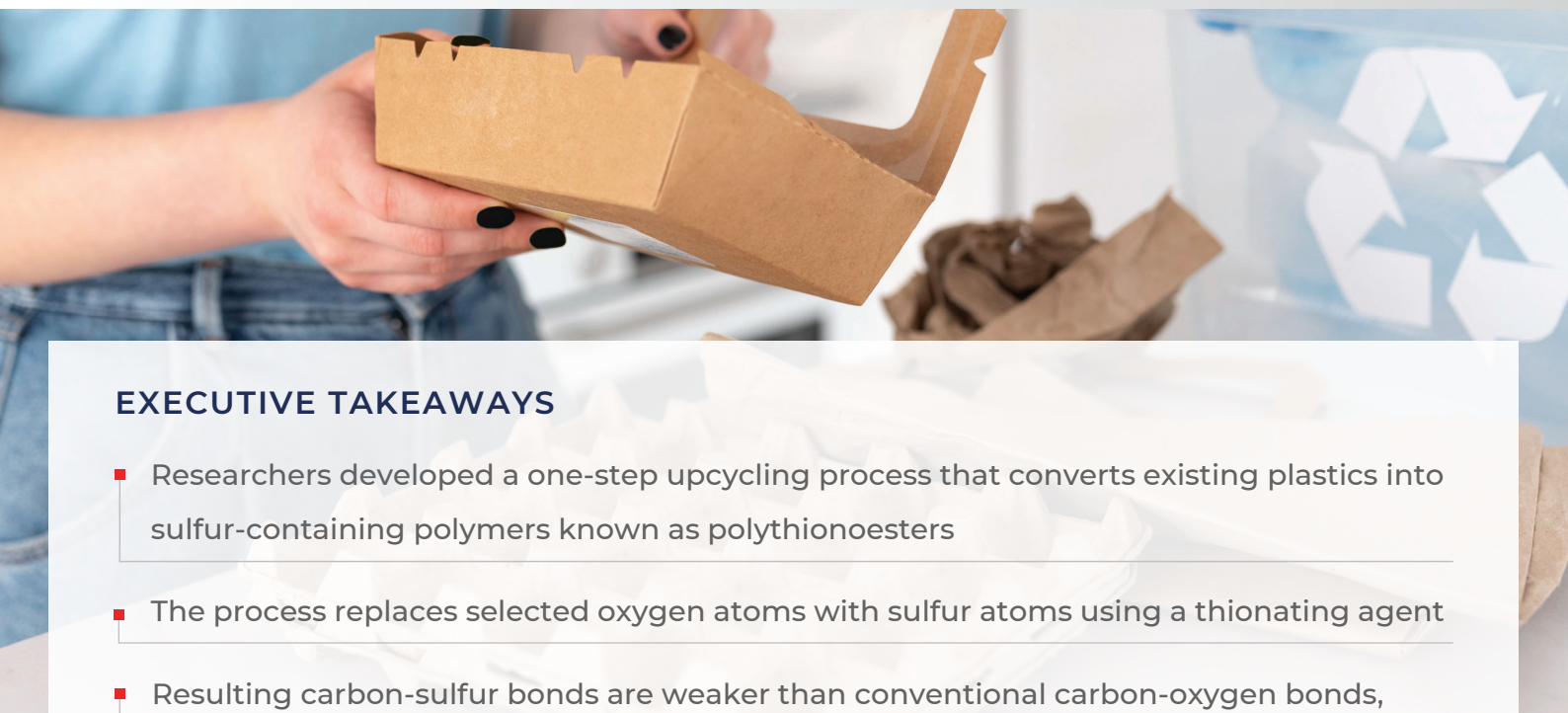
LESSONS & ACTIONABLES

Regulatory readiness increasingly depends on an organization's ability to manage packaging data, demonstrate compliance, and adapt quickly to evolving regional requirements.

Polymer Chemistry Opens New Pathways for Circular Packaging

WHY IT MATTERS

The next wave of circular packaging innovation may come from redesigning the chemistry of existing materials, creating polymers that retain functionality while offering improved degradation characteristics.



EXECUTIVE TAKEAWAYS

- Researchers developed a one-step upcycling process that converts existing plastics into sulfur-containing polymers known as polythionoesters
- The process replaces selected oxygen atoms with sulfur atoms using a thionating agent
- Resulting carbon-sulfur bonds are weaker than conventional carbon-oxygen bonds, enabling improved degradation
- Innovation addresses a major challenge as approximately 99% of plastics currently in circulation are not biodegradable
- Existing biodegradable alternatives often require elevated temperatures or harsh chemical treatments to break down effectively
- Technology was successfully demonstrated using polycaprolactone (PCL), a polymer used in food packaging, biomedical applications, and 3D printing
- The process is designed for industrial scalability
- Creates higher-value materials rather than downcycling plastics into lower-value applications



EXECUTIVE TAKEAWAYS

- Potential future applications extend across packaging, healthcare, manufacturing, and consumer products
- Supports efforts to reduce persistent plastic waste while improving circular material systems
- Demonstrates growing innovation in chemical recycling and polymer redesign

LESSONS & ACTIONABLES

Future material innovation may increasingly focus on redesigning polymers for circularity at the molecular level rather than relying solely on traditional recycling systems.

Recyclability Debates Shift Toward Evidence and Infrastructure

WHY IT MATTERS

As circular economy requirements become more rigorous, packaging materials are increasingly being evaluated on the strength of their collection systems, processing infrastructure, and end-market demand rather than perception alone.

EXECUTIVE TAKEAWAYS

- A comprehensive industry study assessed recycling infrastructure for EPS, XPS, GPPS, and HIPS packaging materials across North America
- The study identified **81 companies operating 119 facilities** processing EPS and XPS materials
- More than 52% of facilities operate as manufacturing end markets that use recovered material as feedstock
- EPS transport packaging currently achieves a 31% recycling rate in North America
- Material recovery is supported by more than 700 collection locations and dedicated commercial recovery programs
- Commercial recovery channels typically experience lower contamination levels, improving recycling efficiency
- Researchers identified 45 companies operating 50 facilities processing GPPS and HIPS materials
- Packaging applications include yogurt cups, produce containers, bakery clamshells, and foodservice packaging

EXECUTIVE TAKEAWAYS

- Approximately 13% of surveyed companies reported using recovered GPPS and HIPS in manufacturing new consumer products
- Mechanical recycling and emerging chemical recycling technologies both support material recovery
- EPS consists of approximately 95% to 98% air, contributing to lightweight transportation advantages
- Lifecycle assessment findings suggest lightweight EPS can reduce emissions compared with some heavier alternatives
- Debate continues regarding materials classified as problematic within circular economy frameworks
- US Plastic Pact reporting changes altered participant performance measurements
 - **92% elimination of listed materials in 2022**
 - **22% in 2023 under revised methodology**
 - **29% in the most recent reporting period**
- USPP now targets **100% participant compliance by 2030**
- Industry efforts continue to focus on collection infrastructure, recycling capacity, end-market transparency, recovery systems, and recycling technology innovation

LESSONS & ACTIONABLES

The future role of packaging materials will increasingly be determined by proven recovery systems and demonstrated circular performance rather than assumptions about recyclability.



Web Packaging Solutions
TRUSTED PARTNERS FOR FLEXIBLE PACKAGING

For inquiries & market intelligence

info@webpackagingsolutions.com



11490 Westheimer Rd Suite 970, Houston TX 77077, United States



+1 832-341-1222



info@webpackagingsolutions.com



www.webpackagingsolutions.com