EPR

EXTENDED PRODUCER RESPONSIBILITY

THERMOFORM *Toolkit*

PROVIDED BY

PLASTIC INGENUITY

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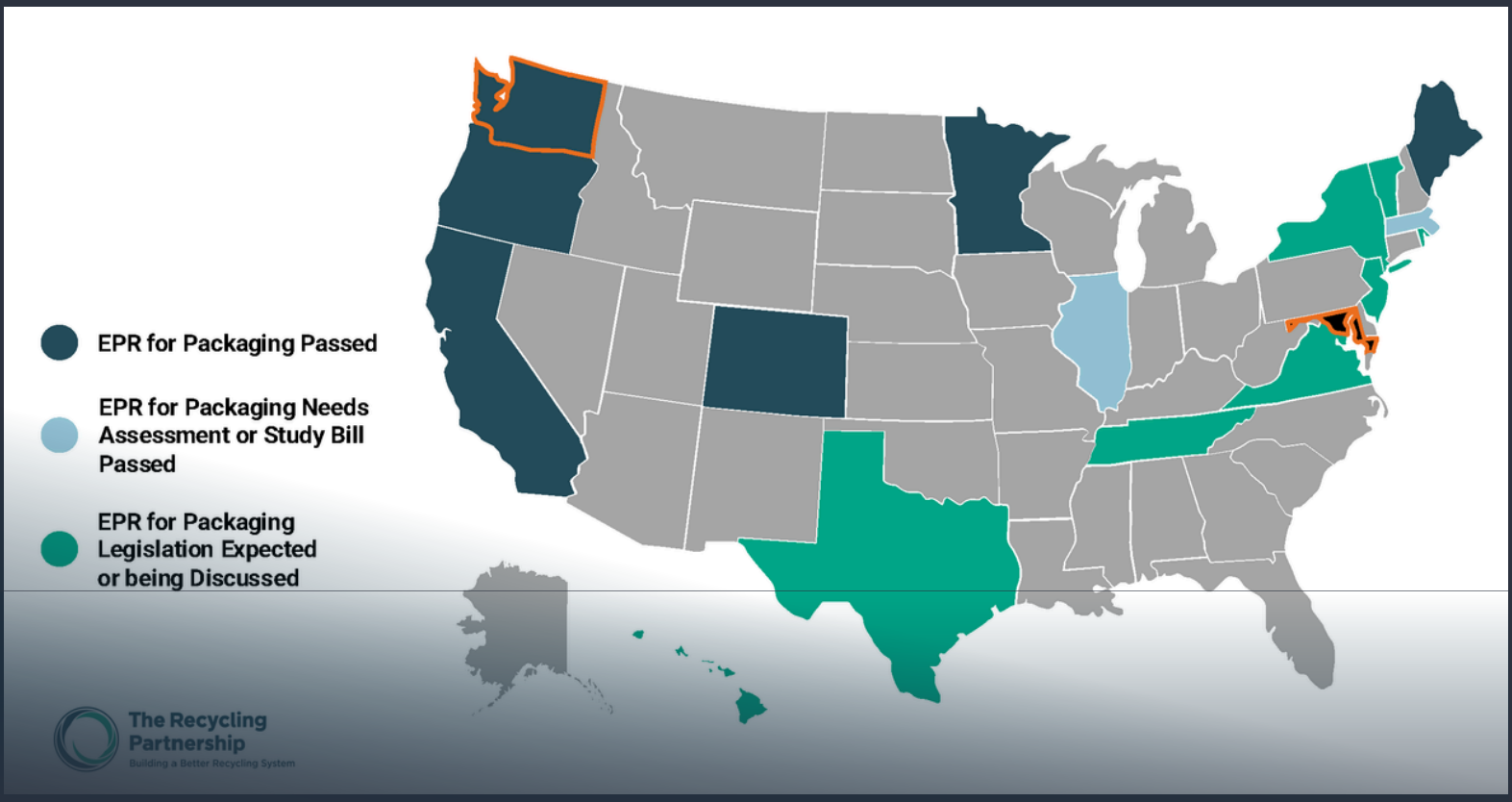
IMPACTS OF EPR LEGISLATION ON THERMOFORMS

As of mid-2025, Extended Producer Responsibility, or EPR for short, for packaging is gaining significant traction across the United States. Seven states—Maine, Oregon, California, Colorado, Minnesota, Maryland, and Washington—have enacted EPR laws, with Maryland and Washington joining the list in May 2025. These laws shift the financial and operational responsibility for packaging waste management from municipalities to Producers, aiming to improve recycling rates and reduce environmental impacts.



The implementation timelines and requirements vary by state, but collectively, these initiatives mark a substantial move toward a circular economy. As a result, approximately 20% of the U.S. population now resides in states with active packaging EPR legislation.

Non-compliance is not an option. Non-compliant Producers may face significant monetary fines. For example, California's EPR statute allows for penalties of up to $50,000 per day per violation. States may prohibit the sale of products in non-compliant packaging, effectively barring a company from entering or remaining in that market. In some cases, repeated or severe non-compliance can result in suspension or loss of business licenses related to packaging distribution.

Producers can accelerate compliance by concentrating on core tenets, despite differing state requirements. In this toolkit, we'll cover three core tenets of packaging EPR: Design for Recyclability, Source Reduction, and Post-Consumer Recycled Content. Although the information contained within is not legal advice, our goal is to equip you with practical strategies and tools to meet regulatory requirements while advancing your sustainability goals. If your company qualifies as an obligated producer under EPR laws, be sure to register with the designated producer responsibility organization (PRO) in each applicable state.

OVERVIEW

Key EPR Tenet	Description	Current State for Thermoforms	Pathway to Compliance
Recyclable Packaging	In California, all covered packaging must meet recyclability standards, or producers lose the ability to make recyclability claims by 2025. Stricter requirements are set for 2032; non-compliance by then could result in sales bans and civil penalties. California has ambitious recycling rate targets for covered materials: • 30% by 2028 • 40% by 2030 • 65% by 2032	Non-bottle PET and Polypropylene containers, like thermoforms, both have a national residential recycling rate of 8%. In California, non-bottle PET containers have a residential recycling rate of 14% and Polypropylene containers have a residential recycling rate of 13%. Residential recycling rate data is derived from The Recycling Partnership's 2024 State of Recycling Report.	Transition to recyclable materials. For example, shift from PVC or PS to PET. Follow design for recyclability guidelines such as the Association of Plastic Recycler's Design Guide or How2Recycle label framework. To aid in design for recycling mandates, Plastic Ingenuity evaluates every thermoform design for recyclability requirements.

Key EPR Tenet	Description	Current State for Thermoforms	Pathway to Compliance
Plastic Source Reduction	California mandates a reduction in plastic use by: • 10% by 2027 • 20% by 2030 • 25% by 2032 Only 8% of the source reduction can come from post-consumer recycled content. At least 10% of the source reduction must come by shifting to reuse or refill by 2032. These reduction targets aim to decrease unnecessary packaging and limit the use of virgin materials.	The baseline year for source reduction reporting is 2023. However, brands may receive credit for down-gauging efforts dating back to 2013 with proper evidence. Brands are gathering part weight data and legacy evidence of downgauging efforts.	Maximize post-consumer recycled materials when possible. Plastic Ingenuity offers PCR options for PET, PP, and HDPE. Identify down-gauging opportunities to reduce material usage. Document PCR and minimization efforts for reporting. Plastic Ingenuity's Sustainable Packaging Assessment provides impact data related to increases in PCR and down-gauging efforts.

Key EPR Tenet	Description	Current State for Thermoforms	Pathway to Compliance
PCR Usage	States and countries with active PCR mandates for non-bottle rigids are New Jersey, California, and Canada. New Jersey's minimum PCR content law came into effect in 2024: • 10% PCR content in 2024 • 50% PCR by 2036 California will begin requiring PCR in 2027: • 10% by 2027 • 20% by 2030 • 25% by 2032 Canada will begin requiring PCR starting in 2025: • 20% PCR starting in 2025 • Increases to 50% by 2030	Sources for PCR PET are readily available. Sources for PCR polypropylene are growing. However, there is concern from brands about the availability of PCR supply to meet escalating demand. Due to stagnant domestic recycling rates, imports of recycled materials have increased to meet rising demand, but concerns remain about the credibility of PCR coming from offshore sources.	Evaluate opportunities to maximize PCR wherever possible. Plastic Ingenuity provides a range of recycled material options for PET, HDPE, and polypropylene packaging. Our materials portfolio includes FDA No Objection Letter (NOL) status for food-grade applications, with sources from both mechanically and advanced recycled processes, supported by ISCC PLUS mass balance allocation. Third-party certifications for PCR materials are available to ensure credibility and transparency of recycled material sources.

KEY TENET

Design for

RECYCLABILITY

Designing thermoformed packaging with recyclability in mind is no longer optional—it's a core requirement under emerging Extended Producer Responsibility (EPR) laws. As regulatory pressures mount, Producers must take proactive steps to ensure their packaging aligns with evolving standards. Here's a four-step approach to help brand owners and manufacturers transition toward EPR compliance.

1 Analyze Your Packaging Portfolio

Begin by reviewing the Covered Materials List for each applicable EPR law. These lists outline which packaging types are regulated and often specify exemptions, such as for medical device packaging. The lists are typically available on the website of the regulatory agency, often the state's Department of Environmental Protection or Environmental Management. Compare your existing packaging portfolio to these lists to identify which products are subject to compliance.

Each state will also issue recyclability guidance, detailing the criteria an item must meet to be considered recyclable—typically based on factors like consumer access, sortability at material recovery facilities (MRFs), and the existence of responsible end markets. These guidelines often culminate in a statewide recyclables list, which serves as the official standard for what qualifies as recyclable under EPR laws.

2 Conduct a Design for Recycling Assessment

Once you've identified your covered materials, evaluate their recyclability. Start by grouping your portfolio into standard formats—such as “PET thermoforms”—and compare these groups against the statewide recyclables list to identify compliance gaps.

To deepen this assessment, leverage leading industry tools like the Association of Plastic Recyclers (APR) Design Guide and the How2Recycle labeling program. The APR guide offers practical direction on how design elements—such as labels, inks, adhesives, and closures—impact recyclability. Meanwhile, How2Recycle supports consumer education by providing clear recycling instructions, which can improve correct disposal and sorting.

3 Take Action on Non-Compliant Materials

After identifying gaps, it's time to act. One of the most effective steps a Producer can take is transitioning away from hard-to-recycle materials like PVC and polystyrene (PS) in favor of PET, a resin with wide acceptance in recycling systems.

PET is not only curbside recyclable in most U.S. communities, but it also maintains strong aftermarket value. It can be reused in applications ranging from new packaging to textiles and containers.

4 Integrate Design for Recycling into Development

To ensure long-term compliance, embed design for recycling principles directly into the packaging development process. At Plastic Ingenuity, every thermoformed design is evaluated for recyclability, with careful attention to material selection, labeling systems, adhesives, and lidding components.

Our design process considers lifecycle impact, end-of-life outcomes, and evolving regulatory requirements. This holistic approach ensures your packaging is not only functional and visually appealing but also built for recyclability from the start.

Conclusion

Designing for recyclability is no longer a value-add—it's a necessity. It requires thoughtful material choices, adherence to proven design guidelines, and a commitment to continuous improvement. By aligning your packaging development process with tools like the APR Design Guide and How2Recycle, you can create packaging that supports recycling infrastructure, meets EPR requirements, and advances your brand's sustainability goals.

Design for Recyclability

REAL-WORLD APPLICATION

Ensuring Recyclability through APR Critical Guidance Program

THE CHALLENGE

Tyson Foods, the fastest growing portfolio of protein-centric brands, desired a recycling assessment on their Hillshire Snacking tray family. As Tyson expands its brand, feeding more and more people, they value finding a sustainable way to do it. The goal of this initiative was to ensure package compatibility with curbside mechanical recycling by leveraging APRs (Association of Plastic Recycler's) Critical Guidance Recognition Program.

THE PROCESS

Plastic Ingenuity conducted a sustainable packaging assessment of the Hillshire Snacking tray family. This assessment included a recyclability evaluation using APR PP Critical Guidance protocol as a guide. As part of the upfront assessment, Plastic Ingenuity recognized the paper component in the attached label was not compatible with recycling systems.

Plastic Ingenuity facilitated conversation to source a polypropylene label instead of paper. The most difficult and aggressive design was chosen for the Critical Guidance testing. Logic being that if the most aggressive design passes, the others will pass as well. A variety of tests were conducted to simulate the recycling process: sortation, processing, and physical property tests. In addition, the new PP pressure-sensitive label was tested to guarantee there was no impact on recyclability.

THE SOLUTION

Test results showed all required APR protocols were successfully met for the tray and new label. The results were reviewed with APR, and Critical Guidance Recognition was issued. Overall, Tyson's tray family met and exceeded the strictest APR PP Critical Guidance protocols.

THE RESULTS

7
different designs in tray family

0
compromise to performance

100%
capture rate in the lab simulation

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KEYTENET

Incorporating

RECYCLED CONTENT

Post-consumer recycled (PCR) content mandates are playing an increasingly important role in Extended Producer Responsibility (EPR) laws for packaging. While PCR requirements may not always be written directly into EPR statutes, they often exist alongside or in coordination with them, both aiming to reduce reliance on virgin materials and enhance circularity.

New Jersey's Recycled Content Law sets one of the most aggressive standards to date for rigid plastic containers, requiring 10% PCR content starting in 2024, increasing by 10% every three years until it reaches 50% by 2036. While food-grade containers are initially exempt, they must meet the same PCR requirements beginning in 2027.

Here's a four-step approach to help brand owners and manufacturers effectively integrate PCR content into their compliance strategies:

1 Analyze Your Packaging Portfolio

Start by reviewing the Covered Materials List for each applicable EPR and PCR statute. These lists define which packaging types are regulated and often specify exemptions, such as for nutraceuticals. They're typically available on the website of the relevant state agency, such as the Department of Environmental Protection or Environmental Management.

Once you've identified which of your packaging types are covered, evaluate your portfolio accordingly. Since PCR requirements vary by state, understanding the nuances of each jurisdiction is critical. For brands with national distribution, it may be most efficient to align with the most stringent state requirements to simplify compliance across all markets.

2 Conduct a PCR Content Analysis

After determining your covered materials, group your packaging by type and identify the current levels of PCR content. This data may be found in packaging specifications or obtained from your supplier network.

Next, calculate what's needed to meet your target PCR levels. Keep in mind that compliance often requires gradual increases, so laying out a roadmap over time is essential. Some states, like New Jersey, allow brands to meet targets per container category, meaning one SKU can offset another as long as they are in the same group. Others, like California, require PCR to be present in each individual covered container. Furthermore, mass balance PCR from advanced recycling processes may not be accepted under certain statutes, so material sourcing matters.

3 Take Action – Maximize PCR Opportunities

Convene stakeholders to evaluate where PCR can be incorporated most effectively within your packaging portfolio. Plastic Ingenuity offers a comprehensive selection of PCR materials in PET, HDPE, and PP, the most common resins used in thermoforming.

For brands requiring food-grade packaging, PCR materials with FDA No Objection Letter (NOL) status can be used, ensuring safety for direct food contact without compromising regulatory compliance or performance.

Given growing scrutiny of sustainability claims, transparency and traceability are key. Third-party certifications such as ISCC PLUS offer an auditable chain of custody, helping ensure PCR sourcing is credible and compliant. Leveraging certified PCR gives brands the confidence to support sustainability claims in regulatory filings, customer communications, and ESG reporting.

4 Measure and Track Impact

To meet regulatory requirements, brands need systems to track and measure the impact of using more post-consumer recycled (PCR) content. This starts with collecting accurate PCR data from suppliers and quantifying reductions in virgin plastic, emissions, and material use. Tools like LCAs and supplier impact calculators offer valuable insights. Consistent documentation is essential for compliance and stakeholder reporting. Plastic Ingenuity's Sustainable Packaging Assessment supports this by providing clear, data-driven metrics on PCR usage and environmental impact.

Conclusion

As EPR laws evolve, PCR content is becoming a cornerstone of packaging compliance and sustainability strategy. For consumer brands using thermoformed packaging, increasing PCR content satisfies legal requirements and reinforces brand leadership in advancing a more circular economy.

Incorporating Recycled Content

REAL-WORLD APPLICATION

Creating a Functional Screen Installation Package for Otter Products

THE CHALLENGE

Otter Products asked Plastic Ingenuity to create an innovative, re-designed glass screen protection installation tool. Their goal was to enhance the unpacking experience for customers and simplify installing screen protectors on smartphones. Otter Products and Plastic Ingenuity applied creative thinking by introducing a thermoformed PCR installation tool. This new tool brought about a redesign of the product packaging, which aimed to provide clear instructions and improve the overall experience of screen protection installation. The thermoformed tool proved to be a technical breakthrough, allowing Otter Products to create a leading installation tool that could be used on virtually all smartphone devices with unparalleled accuracy compared to previous instruments.

THE PROCESS

Plastic Ingenuity's significant shift to 100% PCR PET was supported by our sustainability experts. The installation tool, primarily for smartphone screens, used a locking mechanism and cardboard sleeve for optimal protection. Users achieved 100% accurate application after comprehensive testing. Otter Products reduced costs by 40% by shifting from injection-molded to thermoformed tools, streamlining inventory with universal design for multiple phone sizes.

The redesigned tool had a rubber band and secure assembly, enhancing user experience, distribution, and transportation efficiency. Structural and graphic improvements provided an organized, seamless unpacking experience, elevating consumer acceptance and making installation a positive part of the product experience.

THE SOLUTION

The previous injection molded installation tool used non-recyclable virgin materials, posing a significant environmental challenge. Plastic Ingenuity achieved a more sustainable solution by switching to a thermoformed package made from 100% PCR PET material. The new material was recyclable in certain municipalities and regions, promoting responsible waste management practices. Furthermore, reducing package weight from 29.2g to 20.1g improved transportation efficiencies and contributed to lower carbon emissions during distribution.

THE RESULTS

9.2
Reduced package weight by 9.2g

100%
Incorporated 100% PCR PET

40%
Reduced package cost by 40%

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KEYTENET

Plastic Source

REDUCTION

As consumer brands strive to meet both sustainability goals and Extended Producer Responsibility (EPR) requirements, source reduction presents a powerful opportunity to reduce environmental impact. Several states with EPR laws include source reduction mandates, either through measurable targets or incentives like eco-modulated fees.

Among these, California's SB 54 sets the most aggressive standard to date, requiring a 25% reduction in single-use plastic packaging by weight by 2032, using 2023 as the baseline. Here's a four-step approach to help brand owners and manufacturers integrate source reduction into their EPR compliance strategy.

1 Analyze Your Packaging Portfolio

Start by reviewing the Covered Materials List for each applicable EPR law. These lists identify which types of packaging are regulated and typically note any exemptions, such as medical device packaging. They're usually available through the state's Department of Environmental Protection or Environmental Management.

Once you know which materials are covered, assess your portfolio accordingly. Since source reduction requirements vary by state, it's important to understand the specific expectations for each jurisdiction. If your products are distributed nationally, consider aligning your efforts with the most stringent requirements to streamline compliance across all markets.

2 Conduct a Source Reduction Analysis

After identifying your covered materials, categorize your packaging types and establish a baseline weight for each. This data might come from your packaging specifications or supplier networks.

Next, calculate the reduction needed to meet state requirements. Achieving compliance may involve incremental milestones over time, so establishing a clear roadmap toward your target is essential.

3 Take Action – Do More with Less

Bring cross-functional stakeholders together to define strategies for achieving source reduction. Options may include:

- Lightweighting current packaging formats
- Transitioning to reusable or refillable systems
- Eliminating unnecessary packaging
- Innovating with alternative materials

It's critical to balance source reduction with other design priorities, especially recyclability and product protection.

Thermoformed packaging offers a built-in source reduction advantage. It is inherently lighter than many other rigid formats, such as injection-molded packaging. Down-gauging—reducing material thickness without compromising performance—is often achievable without costly mold changes, unlike in injection molding.

Optimizing material thickness requires careful consideration of strength, safety, and shelf appeal. But even small reductions can result in substantial material savings at scale. Modern materials and thermoforming techniques allow for high-performance, low-impact packaging designs.

Additionally, incorporating post-consumer recycled (PCR) content into your packaging can further reduce the need for virgin plastic. Maximizing PCR not only supports circularity but can also count toward source reduction goals—though note that California currently limits PCR contribution to source reduction at 8%.

4 Document and Measure to Drive Continuous Improvement

Implementing changes is only half the equation. Tracking and documenting your progress are critical for compliance reporting, investor communications, and retailer sustainability scorecards.

Maintain clear, verifiable data on your source reduction efforts, including the weight of materials reduced and PCR content used. This transparency builds trust and strengthens your brand's sustainability narrative.

Plastic Ingenuity supports brands through its Sustainable Packaging Assessment, which provides impact data on PCR usage and material reduction strategies. This tool helps quantify your results, identify further optimization opportunities, and communicate your progress with clarity and credibility.

Conclusion

Source reduction is a foundational component of many EPR regulations. By focusing on strategies like downgauging and maximizing PCR content, brands can make significant strides toward a more sustainable packaging portfolio. These efforts not only support regulatory compliance, but they also deliver real environmental benefits and strengthen consumer trust.

Plastic Source Reduction

REAL-WORLD APPLICATION

Healthcare Packaging Material Innovation

THE CHALLENGE

Merit Medical Systems, Inc., a manufacturer of single-use medical devices for interventional and diagnostic procedures, turned to Plastic Ingenuity to design a solution to eliminate shipping damage, decrease material waste, and reduce packaging costs.

Merit's inflation devices for angioplasty procedures consist of multiple configurations, including a range of sizes, lengths of tubing, and various gauges. Unfortunately, the delicate gauge often incurred damage during global distribution from vibration, shock, and environmental stresses. Due to the challenges Merit faced passing validation, the product line launched using single-device, single-use packaging consisting of a PETG tray and insert, Tyvek lid, carton, and heavy duty corrugate. As the product line expanded, this stop-gap solution led to increasing material waste, labor, warehousing, and distribution.

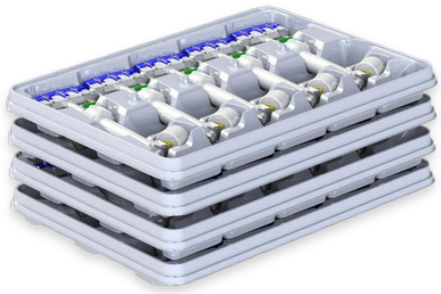
THE PROCESS

Material selection is critical for shipping trays. Commonly used materials like HIPS are rigid and unforgiving. To develop a solution capable of delivering the protection required, we leveraged Eastalite™ copolyester, a novel foamed PETG material. As the first commercial Eastalite™ application on the market, this material provides a lower density than traditional rigid materials, greater abrasion resistance, and improved shock absorption and impact strength.

After selecting the material, we designed a bulk universal tray capable of accommodating all devices, sizes, and configurations with one tray. The universal cavity design prevents device vibration and movement, improving product protection with zero rejects in the bulk pack solution.

THE SOLUTION

Our universal transport tray design innovation created a single packaging component that works with multiple devices within the same product line. The trays also offer improved product protection, minimum bending to the flexible tubing, no tray-to-product contact, and reusability. This first-to-market Eastalite™ application provides cushioning to prevent damage to the delicate device while being robust enough for reuse ≥ 4x. The solution exceeded all functional, economic, and environmental goals.



THE RESULTS

133%
increase in devices per pallet

57%
reduction in transatlantic freight costs

52%
reduction in packaging material costs

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FREQUENTLY ASKED QUESTIONS

1 Does EPR work?

The Recycling Partnership studied seven EPR programs around the world and found that the policy substantially increased collection and recycling of target materials across the board. Recycling rates climbed as high as 90% after EPR implementation.

	Pre-EPR	With EPR
British Columbia	50-57%	81%
Belgium	10%	89.8%
Spain	4.8%	80.7%
Netherlands	70%	82%
South Korea	64%	78%
Quebec	28%	64%
Portugal	38%	60.4%

2 Is EPR tax?

No, EPR is not a tax—it's a regulatory framework that requires producers to take financial and operational responsibility for managing their products' end-of-life impacts. Unlike a tax, which goes into a state's general fund and can be used for any purpose, EPR statutes typically establish a dedicated fund where producer contributions are specifically allocated to support the program.

3 What are the fees?

The fees vary from state to state. They are assessed by the Producer Responsibility Organization (PRO) based on factors such as material types, weight, recyclability, and use of recycled content. A concept called "eco-modulation" is often leveraged to incentivize more sustainable designs. A brand should consult with the PRO for specifics.

4	What do the EPR fees cover?	The fees cover program needs as assessed by the state regulators. These typically include recycling and waste disposal operations, recycling infrastructure investments, consumer education, and administrative costs.
5	Who are the obligated Producers?	This answer is nuanced since the definition of obligated producer differs in each state. The obligated producer is typically the brand owner, manufacturer, or importer that first sells or distributes packaged products in the state. Brands should consult the PRO for guidance.
6	What is a Producer Responsibility Organization?	A Producer Responsibility Organization, or PRO, is a third-party entity that manages the responsibilities of producers under an EPR program, such as collecting fees, coordinating recycling operations, ensuring regulatory compliance, and reporting program outcomes on behalf of its member companies. Circular Action Alliance is emerging as the PRO in many EPR states.
7	When do the laws take effect?	Each state sets its own schedule. The Oregon program is the first to launch, starting in July 2025. A phased rollout in California starts in 2025. The other states start in 2026 or later.
8	What happens if a company doesn't comply?	Non-compliant Producers may face significant monetary fines. For example, California's EPR statute allows for penalties of up to $50,000 per day per violation. States may prohibit the sale of products in non-compliant packaging, effectively barring a company from entering or remaining in that market. In some cases, repeated or severe non-compliance can result in suspension or loss of business licenses related to packaging distribution.
9	What will Producers need to report?	Producers must report packaging data such as the types, weights, and volumes of covered materials sold in the state. They must also report how the packaging aligns with recycling guidelines and uses post-consumer recycled materials or other sustainable attributes.
10	How can Producers reduce their fees?	There are several ways to minimize fees. These include designing for recycling, source reduction, and using post-consumer recycled materials. Producers should understand the eco-modulation incentives in each state and align packaging efforts accordingly.

HOW CAN WE *help?*

Connect with us to schedule your free Lunch & Learn.
Email us at sustainability@plasticingenuity.com

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